PB90-153768

Superfund Record of Decision (EPA Region 1)
Kellogg-Deering Well Field, Norwalk, CT
(Second Remedial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

29 Sep 89

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R01-89/039	2.	3. Recipient's Accession No. PB 90 153768/AS

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Kellogg-Deering Well Field, CT
Second Remedial Action

5. Report Date
09/29/89

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Orgainization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Kellogg-Deering Well Field site is a 10-acre contaminated municipal well field in Norwalk, Fairfield County, Connecticut, which includes adjacent source areas that contribute to the well field contamination. The site lies within the Norwalk River's 100-year floodplain and consists of four municipal drinking water wells that supply approximately 25 percent of the water for the 45,000 residents in Norwalk. The city detected elevated TCE levels in the wells during routine monitoring in 1975 and subsequently shut down unacceptably contaminated wells until a redwood slat treatment system was installed in 1981. EPA conducted a remedial investigation between 1984 and 1986 leading to a 1986 Record of Decision (ROD) which required the city to operate an air stripping unit. EPA conducted a subsequent remedial investigation in 1987 which further defined the contaminated ground water area and identified the Elinco/Pitney Bowes/Motleis Court Complex, located east of the site and upgradient of the well field, as a source of ground water contamination. This ROD, the second of three planned operable units, addresses the major source area. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, PCE, TCE, toluene, and xylenes.
(See Attached Sheet)

17. Document Analysis a. Descriptors
Record of Decision - Kellogg-Deering Well Field, CT
Second Remedial Action
Contaminated Media: soil, gw
Key Contaminants: VOCs (benzene, toluene, PCE, TCE, xylenes)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 124
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

PB90-153768

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R01-89/039
September 1989

EPA

Superfund Record of Decision:

Kellogg - Deering Well Field, CT

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U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

EPA/ROD/R01-89/039
Kellogg-Deering Well Field, CT
Second Remedial Action

16. Abstract (Continued)

The selected remedial action for this site includes onsite in situ vacuum extraction followed by carbon adsorption to remediate soil underlying the major source area at the court complex; ground water pumping and onsite treatment using air stripping followed by offsite discharge; and periodic sampling of ground water, soil vapor, and indoor air. The estimated present worth cost for this remedial action is $9,100,000, which includes a present worth O&M cost of $3,034,000 for 30 years.

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RECORD OF DECISION
DECLARATION STATEMENT
KELLOGG-DEERING WELL FIELD SUPERFUND SITE
OPERABLE UNIT 2 - SOURCE CONTROL

September 1989

SITE NAME AND LOCATION

Kellogg-Deering Well Field Superfund Site
Norwalk, CT

STATEMENT OF PURPOSE

This Decision Document presents the selected remedial action for the second operable unit for source control of this National Priorities List site in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Contingency Plan, 40 C.F.R. Part 300 et seq. (1987). The Regional Administrator for Region I of the United States Environmental Protection Agency (EPA) has been delegated the authority to approve this Record of Decision.

The State of Connecticut has concurred on the selected remedy and has determined that it is consistent with Connecticut laws and regulations.

STATEMENT OF BASIS

This decision is based on the Administrative Record for the site developed in accordance with Section 113(k) of CERCLA. The attached index identifies the items that comprise the Administrative Record.

The Administrative Record is available for public review at the Norwalk Public Library and the EPA Region I Waste Management Division Records Center at 90 Canal Street in Boston, Massachusetts.

DESCRIPTION OF THE SELECTED REMEDY

The response action for the second operable unit at the Kellogg-Deering site is a comprehensive remedy for the second operable unit that combines components of source control and management of migration within an area of high contaminant concentrations. The source control component will include an in-situ soil vacuum extraction system to remediate contaminated soils underlying buildings and parking lots at the Elinco/Pitney Bowes/Matheis Court Complex. Soils will be cleaned to levels that will protect the quality of groundwater in the event that the buildings and parking lots are removed at some time in the future.

The management of migration component consists of groundwater extraction, treatment and discharge within a highly contaminated portion of the aquifer known as the Source Area. The aquifer is composed of unconsolidated overburden and bedrock. Groundwater will be pumped with the objective of achieving Safe Drinking Water Act Maximum Contaminant Levels in the aquifer.

DECLARATION

The selected remedy is protective of human health and the environment and attains Federal and State requirements that are applicable or relevant and appropriate. In addition, the selected remedy is cost effective; satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element; and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

The selected remedy will result in hazardous substances remaining on-site above health based levels. Therefore, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Sept 29, 1989
Date

Paul Keough
Paul G. Keough,
Acting Regional Administrator
EPA Region I

RECORD OF DECISION SUMMARY
KELLOGG-DEERING WELL FIELD SUPERFUND SITE
OPERABLE UNIT 2 - SOURCE CONTROL

September 1989

CONTENTS

Declaration i

Location and Description 1

Site History 2
  Response History 2
  Enforcement History 3

Community Participation 3

Scope and Role of Operable Unit 4

Site Characteristics 5
  Groundwater 5
  Soil 7
  Indoor Air 8

Summary of Site Risks 8
  Groundwater 8
  Soil 12

Documentation of Significant Changes 12

Development and Screening of Alternatives 16
  Statutory Requirements/Response Objectives 16
  Technology and Alternative Development and Screening 17

Description of Alternatives 19
  Alternative I 19
  Alternative II 20
  Alternative III 21
  Alternative IV 22
  Alternative V 22
  Alternative VI 23
  Alternative VII 25
  Alternative VIII 25

Selected Remedy 25
  Remedial Action Objectives/Cleanup Goals 26
    Groundwater 26
    Soil 27
  Description of Components of the Selected Remedy 28
    Contaminated Soil Treatment 28
    Contaminated Groundwater Extraction and Treatment .. 29

Rationale for Selection 31

Summary of Comparative Analysis of Alternatives 32
Overall Protection of Human Health and the Environment... 32
Compliance with ARARs........ 33
Long-term Effectiveness and Permanence........ 34
Reduction of Mobility, Toxicity or Volume 35
Short-term Effectiveness........ 35
Implementability........ 36
Cost........ 36
Community Acceptance........ 37
State Acceptance........ 37
Conclusion........ 37

Statutory Determinations 38
Protection of Human Health and the Environment 38
Compliance with ARARs 39
Cost Effectiveness 41
Permanent Solution/Alternative Treatment/ Resource Recovery 41
Preference for Treatment 42

State Role 42

FIGURES

1. General Location Map 43
2. Kellogg-Deering Well Field Superfund Site Map 44
3. General Cross Section Diagram 44
4. Area of Groundwater Contamination 45

TABLES

1. Indicator Chemicals 46
2. Summary of Remedial Alternatives 47
3 Groundwater and Soil Cleanup Goals 48
4. Estimated Costs for the Selected Alternative 49
5. Comparison of Estimated Costs for Alternatives 50
6. ARARs for the Selected Alternative 51

APPENDICES

Responsiveness Summary........ Appendix A
Administrative Record Index .... Appendix B
State Concurrence Letter .... Appendix C

RECORD OF DECISION SUMMARY
KELLOGG-DEERING WELL FIELD SUPERFUND SITE
OPERABLE UNIT 2 - SOURCE CONTROL

September 1989

LOCATION AND DESCRIPTION

The Kellogg-Deering Well Field Superfund Site is located in Norwalk, CT. The "site" consists of an approximately 10-acre municipal well field (the Kellogg-Deering Well Field) and adjacent areas that contribute to the well field contamination. The well field portion of the site (Figure 1) is located along the western bank of the Norwalk River in southwestern Fairfield County, Connecticut and is bordered on the east by the Norwalk River, on the north by residences along Broad Street, on the west by residences along Lakeview Avenue, and on the south both by wooded acreage and residences in the vicinity of East Lakeview Drive and Nutmeg Place.

The site, considered to be within the study area shown in Figure 2, also includes light industrial and residential areas on the east side of the Norwalk River. The 100 year floodplain of the Norwalk River encompasses the Kellogg-Deering Well Field and low-lying bands along the banks of both sides of the river, including portions of the site.

The Kellogg-Deering Well Field, which is owned and operated by the Norwalk First Taxing District (NFTD) Water Department, consists of four municipal water supply wells that supply approximately 25 percent of the water for the 45,000 residents in the city of Norwalk. The estimated safe yield of the Kellogg-Deering Well Field is estimated to be approximately 3.5 million gallons per day on a long-term basis as reported in Safe Yield Evaluation of the Kellogg-Deering Well Field, Norwalk, CT by Leggette, Brashears and Graham in 1981. The water supply wells are located in an aquifer that is classified as II-A under the EPA Ground Water Protection Strategy and GAA under the State of Connecticut's Water Quality Standards. EPA's II-A classification means that the groundwater is currently and potentially a source of drinking water and other beneficial uses. The Connecticut GAA classification encompasses the immediate vicinity of the Kellogg-Deering Well Field and indicates that the Well Field is an existing or potential public drinking water supply. The aquifer outside of the immediate vicinity of the Well Field is classified by Connecticut as GB/GA which indicates that although the groundwater presently may not be suitable for direct human consumption without treatment due to chemical contaminants or land use impacts, the State maintains a goal to restore the ground water to drinking water quality. A more complete description of the site can be found in Section 1 of the supplemental Remedial Investigation Report (RI).

The site is underlain by two water-bearing geologic formations: overburden and bedrock (Figure 3). The overburden aquifer, composed of primarily sand and gravel, is very thick near and under the Norwalk River (approx. 100 feet) and tapers out toward the east. The depth to the water table varies from between zero feet to approximately 35 feet below ground surface. All four of the Kellogg-Deering water supply wells are located in the overburden aquifer. The bedrock aquifer underlies the overburden aquifer and is closer to the surface as the overburden aquifer thins toward the east. The bedrock aquifer is composed of fractured rock. Groundwater movement in the bedrock aquifer occurs through interconnected fractures.

Operation of the water supply wells at the Kellogg-Deering Wells Field effects the local hydrology in two important ways. First, some surface water from the Norwalk River is drawn downward from the Norwalk River as it passes near the Well Field. Secondly, water from portion of the aquifer located to the east side of the river is drawn underneath the river bed before entering the operating supply wells. As a result, approximately 86 percent of the water entering the supply wells originates as surface water from the Norwalk River while most of the remaining 14 percent comes from the aquifer.

SITE HISTORY

Response History

Elevated levels of trichloroethene (TCE) were first detected in the wells at the Kellogg-Deering Well Field during routine monitoring by the Norwalk City Health Department in 1975. The wells with unacceptable concentrations of TCE were shut down until a redwood slat treatment system was installed by NFTD in 1981. The site was placed on the National Priorities List (NPL) in 1984. An initial Remedial Investigation and Feasibility Study (RI/FS) was conducted at the site between 1984 and 1986. The initial RI/FS supported the first operable unit Record of Decision (ROD) issued in September 1986, that required completion of construction and operation of a new air stripping facility (well head treatment) at the Kellogg-Deering Well Field. The well head treatment removes TCE and other volatile organic compounds (VOCs) from the contaminated groundwater prior to discharge into a conventional water treatment plant and the water distribution system. The well head treatment was designed to supply safe, potable water to the public.

A supplemental RI/FS began at the site in 1987 to provide further information regarding the source(s) and extent of groundwater contamination at the site. In addition to better defining the area of groundwater contamination found during the initial RI, the supplemental RI also identified a major source area of groundwater and soil contamination at the Elinco/Pitney Bowes/Matheis Court Complex (the complex) located at 272 and 282 Main Avenue in Norwalk. The supplemental RI concluded that the contamination at the complex is contributing to the contamination at the Kellogg-Deering Well Field and the aquifer supplying the Well Field. The supplemental RI also identified soil gas contamination sources at the complex and provided an analysis of indoor air quality. The complex is considered to be a major soil and groundwater contamination source area. A more detailed description of the site history can be found in the supplemental RI.

Enforcement History

Since July 29, 1986, EPA has notified approximately nine parties who are either past or present owners or operators of the facility of their potential liability with respect to the site. In 1986, EPA issued an administrative order to the Norwalk First Taxing District (NFTD) ordering the NFTD to complete construction of and begin operation of an existing air stripping at the Kellogg-Deering Well Field. By letter dated May 11, 1988, EPA notified NFTD that it had satisfied the requirements of the order.

The potentially responsible parties (PRPs) have been active in the remedy selection process for the site. Comments were submitted by the PRPs during the public comment period. A summary of these comments and EPA's responses to these comments are included in the Responsiveness Summary in Appendix A. The PRPs' comments, the summary of the comments and EPA's responses to these comments are all included in the administrative record.

Special notice has not been issued in this case to date.

COMMUNITY PARTICIPATION

Through the Site's history, the level of community concern and involvement has fluctuated. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

EPA held several public meetings and hearings in connection with the first operable unit for the site. Details of community relations activities in connection with the first operable unit are described in the first operable unit Record of Decision. In June 1986, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about and involved in activities during remedial activities. In January 1988, EPA issued a press release announcing the completion of the Supplemental RI/FS workplan.

On October 31, 1988, EPA made the administrative record available for public review at EPA's offices in Boston and at the Norwalk Public Library. The administrative record was updated with information relating to the second operable unit at both locations on July 26, 1989. EPA published a notice and brief analysis of the Proposed Plan in Norwalk Hour on July 21, 1989. On July 26, 1989 the Proposed Plan was made available to the public at the Norwalk Public Library.

On July 26, 1989, EPA held an informational meeting to discuss the results of the Supplemental Remedial Investigation and the cleanup alternatives presented in the Supplemental Feasibility Study and to present the Agency's Proposed Plan for remedial actions for the second operable unit. Also during this meeting, the Agency answered questions from the public. From July 27, 1989 to August 25, 1989, the Agency held a 30-day public comment period to accept public comment on the alternatives presented in the supplemental Feasibility Study and the Proposed Plan and on the other documents which were a part of the administrative record for the site. On August 14, 1989, the Agency held a public hearing to accept any oral comments. A transcript of this meeting and the comments and the Agency's response to comments are included in the attached Responsiveness Summary.

This decision document presents the selected remedial action for the second operable unit at the Site, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the National Contingency Plan. The decision for the second operable unit is based on the Administrative Record.

SCOPE AND ROLE OF OPERABLE UNIT

The remedy described in this Record of Decision addresses the second of three planned operable units at the Site. The first operable unit Record of Decision, signed in September of 1986, required completion and operation of an existing air stripping unit at the Kellogg-Deering Well Field (wellhead treatment). The wellhead treatment is currently operational and is designed to provide safe drinking water to the residents of Norwalk. This second operable unit Record of Decision addresses a major source of soil and groundwater contamination upgradient of the Kellogg-Deering Well Field. The source area is known as the Elinco/Pitney Bowes/Matheis Court Complex and is considered to be a source of the contamination of the aquifer that supplies the Kellogg-Deering Well Field.

The selected remedy for the second operable unit was developed by combining a management of migration alternative with a source control alternative. In summary, the remedy addresses: 1) highly concentrated residual groundwater contamination emanating from the complex in both the overburden and bedrock aquifers, 2) residual soil contamination existing below the buildings and parking lots at the complex and 3) the introduction of contaminants into the buildings at the complex from underlying contaminated soils.

As described below in the Documentation of Significant Changes section, EPA will address a third operable unit for the site in the future. The third operable unit will, at a minimum, address the area of contamination located downgradient of the Source Area addressed by this Record of Decision.

SITE CHARACTERISTICS

The significant findings of the initial and supplemental remedial investigations are summarized below. A complete detailed discussion of the site characteristics can be found in the initial and supplemental Remedial Investigation reports.

TCE, PCE, and other chemicals were detected in soils and groundwater at the site and in indoor air in the buildings at the site. Surface water and sediment samples were collected and analyzed only during the initial Remedial Investigation. No significant levels of contaminants were found in either the surface water or the sediments to warrant further investigation during the supplemental Remedial Investigation.

As stated above, the Elinco/Pitney Bowes/Matheis Court Complex is a major source of groundwater and soil contamination which is contributing to the contamination of the Kellogg-Deering Well Field and the aquifer supplying the Well Field. The existence of other source areas contributing to contamination of the portion of the aquifer that supplies the Kellogg-Deering Well Field is not precluded.

Groundwater

Groundwater data collected to date indicates that a significant source area of contamination exists below the complex located at 272 and 282 Main Avenue in Norwalk. A plume of groundwater contamination is emanating away from the complex in a semi-radial pattern from the northwest to southwest directions. Contaminant transport occurs in both the overburden and bedrock aquifers. The southwest extent of the plume is migrating below the Norwalk River and intersects the Kellogg-Deering Well Field. The west and northwest edge of the plume appears to extend to Deering Pond and the Norwalk River.

Both the initial RI and the supplemental RI support a finding of migration of groundwater contaminants from the complex through the unconsolidated overburden aquifer and through deep and shallow fractures of the bedrock aquifer to the wells of the Kellogg-Deering Well Field. Some of the contamination has entered bedrock fractures immediately below the buildings at the complex. Contaminants discharge from the bedrock into the overburden aquifer in the vicinity of the Norwalk River and the CL&P Landfill. While the actual location of every fracture containing contaminated groundwater is uncertain, groundwater data collected to date indicates that a "piping system" of bedrock fractures is responsible for contamination migration from the complex to the overburden aquifer near the Kellogg-Deering Wellfield.

A generalized map of groundwater contamination is shown in Figure 4. This map combines groundwater quality data from both the bedrock and overburden aquifers. The map divides the area of contamination into two parts: A Source area and a Downgradient area. The Source area is defined as the approximate area in which TCE concentrations exceed 6,600 micrograms per liter (ug/l). The Downgradient area is the approximate area in which TCE concentrations have been found to be between 5 ug/l and 6,600 ug/l. The concentrations of 5 ug/l TCE is the highest concentration permitted in compliance with federal drinking water standards.

The most pronounced groundwater contaminants from the standpoint of frequency of occurrence and concentration include PCE, TCE, TCA and toluene. These compounds were detected in 52, 79, 42 and 18 of the 115 groundwater samples obtained during the Supplemental RI. Concentrations of these compounds ranged as high as 68,000, 430,000, 2,000 and 14,000 ug/l, respectively. TCE was the most concentrated and widely detected contaminant. Ethyl benzene and 1,2-dichloroethene were detected in 10 and 8 samples, respectively, at concentrations ranging as high as 5,800 ug/l and 4,800 ug/l, respectively. By contrast, none of the other volatile chemicals detected were found at concentrations in excess of 65 ug/l (with the exception of 1 detection of 4-methyl-2-pentanone at 990 ug/l).

Based on the distribution of the dense chlorinated organics in groundwater below the complex, it is apparent that density effects probably play a major role in contaminant movement. High concentrations of PCE (up to 68,000 ug/l) and TCE (up to 430,000 ug/l) were detected in groundwater samples collected from monitoring wells installed on the complex property. Invariably, concentrations in samples from deeper wells exceeded those in samples from shallow wells at the same well cluster locations. It appears possible that a dense non-aqueous phase liquid (DNAPL) may be present below the complex buildings.

PCE and TCE were also frequently detected in downgradient monitoring wells. Both overburden and bedrock monitoring well samples revealed the presence of chlorinated solvents. Concentrations decreased from the source area wells to downgradient wells. However, TCE concentrations ranged as high as 37 ug/l in one of the production wells sampled (Layne 2).

The groundwater contamination above 5 ug/l TCE encompasses approximately 54 acres. It is calculated that 316,000,000 gallons of groundwater are affected and contaminated with approximately 19,400 pounds of soluble TCE plus less quantities of other contaminants. In addition, DNAPL may be present at the complex and possibly downgradient of the complex. Of the total quantity of contaminated groundwater, it is estimated that 15 percent is in bedrock and 85 percent is in overburden.

Soil

Source characterization at the complex was conducted through a soil-gas investigation and subsurface soil sampling and analysis. As a result of the physical nature of the complex property, (three large buildings) characterization of the soil source area was limited. The soil-gas investigation indicated that the majority of the residual contamination at the complex exists beneath the complex buildings. PCE and TCE were the most frequently detected and most highly concentrated chemicals in the soil-gas samples. Eight soil gas samples were collected under the buildings. These samples were several orders of magnitude greater than those in outside the complex buildings.

Approximately 30 subsurface soil borings were taken outside the complex buildings. The PCE subsurface soil sample results indicated that releases to the subsurface occurred in the vicinity of the former processing areas within the buildings. TCE was found in 28 of 104 soil samples in levels ranging from 7 to 3,903 ug/l; PCE was found in 22 of 104 soil samples ranging in concentrations from 3 to 8,688 ug/kg. EPA acknowledged that certain soil samples collected at the complex and analyzed by the Contract Laboratory Program as part of the supplemental Remedial Investigation were suspect (See Matthew Hoagland July 17, 1989 memorandum and NUS Corp. July 20, 1989 letter to EPA in Administrative Record). However, EPA maintains that the estimated 44,000 cubic yards of contaminated soils based on an average depth to bedrock of 12 feet, as concluded in the supplemental Remedial Investigation, is correct.

Indoor Air

An indoor air study performed in the three buildings at the complex was limited to TCE and PCE due to their frequent occurrence in groundwater and soil gas samples beneath and in the vicinity of the complex. Since both PCE and TCE exhibit a strong potential for volatilization, and are thus considered to be mobile in the environment, they were identified as the contaminants of concern. These contaminants were detected in the three study buildings at concentrations ranging from 20 ug/m^3 to 764.3 ug/m^3 (TCE), and from below the detection limits to 45.2 ug/m^3 (PCE).

SUMMARY OF SITE RISKS

A Risk Assessment was performed as part of the supplemental Remedial Investigation to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the site. Sixteen contaminants of concern or "indicator compounds" listed in Table 1 were selected for evaluation in the Risk Assessment. These contaminants constitute a representative subset of the more than 25 contaminants identified at the site during the supplemental Remedial Investigation. The 16 contaminants were selected to represent potential onsite hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment.

Groundwater

Groundwater contaminants at the site include relatively water soluble volatile organics. Monocyclic aromatics (e.g., benzene, toluene, etc.) and chlorinated straight-chain hydrocarbons (e.g., TCA, PCE, TCE, etc.) constitute the predominant groundwater contaminants. All of the potential carcinogenic substances detected in groundwater were included as indicator compounds, regardless of their frequency of occurrence or concentration, and several substances displaying only noncarcinogenic effects (e.g., toluene, ethylbenzene, 1,1,1-trichloroethane, acetone, and 4-methyl-2-pentanone) were also included as indicator compounds.

Human health risks were characterized both quantitatively and qualitatively in the risk assessment with regard to groundwater exposure. Qualitative risks were developed through the comparison of concentrations and/or doses with the appropriate standards and guidelines. The qualitative risks are summarized in Table 6-2 of the supplemental Remedial Investigation. Trichloroethane (TCE) one of the primary contaminants of concern exceeded the Maximum Contaminant Level (MCL) of 5 ug/l and the Maximum Contaminant Level Goal (MCLG) of 0 ppb at 79 of 115 samples taken during the supplemental Remedial Investigation.

Potential human health effects associated with the contaminants of concern in groundwater were estimated quantitatively through the development of several hypothetical exposure scenarios. Incremental lifetime cancer risks and a measure of the potential for noncarcinogenic adverse health effects were estimated for the various exposure scenarios. Exposure scenarios were developed to reflect the potential for exposure to hazardous substances based on the characteristic uses and location of the Site. Factors of special note that are reflected in the Risk Assessment are that the Site is located in a residential and light industrial urban area and that the area is served by a public water supply. Groundwater from the Kellogg-Deering Well Field, blended with water from surface water reservoirs as part of the water supply, is currently being treated for contaminants that are associated with the contaminant plume being addressed in this Record of Decision.

The quantitative risk assessment considered potential exposures associated with household use of potable water. There are numerous routes of exposure associated with household use of contaminated water, including ingestion, inhalation of volatiles emitted from showers, dishwashers, washing machines, bathing, car washing etc. However, since previous experience has shown that ingestion and inhalation of volatiles during showering are the predominant exposure mechanism in the home, these are assessed quantitatively for this exposure route.

EPA estimated potential health effects for future use groundwater using both future conditions (worst case) and future conditions (plausible case) scenarios. Doses under the worst case scenario were developed using the indicator chemical concentrations detected at upgradient locations. The maximum, arithmetic average, and geometric mean groundwater concentrations were used. This exposure scenario provides an indication of groundwater quality at the source and in the aquifer in general. This scenario does not consider the existence of the air stripping column and therefore corresponds to a case under which air stripper failure or decommissioning occurs or if installation of residential wells in locations near the source takes place in the future. For estimating risks from the Well Field, this scenario does not include a dilution factor for the Norwalk River; it assumes the dilution offered by the river is removed (due to silting, dry weather, etc.) The plausible case exposure scenario is similar to the worst-case scenario. Maximum observed, arithmetic average, and geometric mean groundwater concentrations were used. However, it is expected that the air stripping column will continue to operate, and the stripper removal efficiency (99.9%) was included. This scenario included a dilution factor, since only a minor portion of all wellfield water actually originates from the upgradient aquifer. This exposure scenario corresponds to a condition in which the contamination at the complex acts as a continuous source of wellfield contamination.

Quantitative risk estimates are generated through the use of Carcinogenic Potency Factors and Reference Doses. Risks from exposure to chemicals that are associated with noncarcinogenic health effects are assessed by calculating the ratio of the estimated dose from exposure to each noncarcinogenic compound to a reference dose. A reference dose is the dose below which no adverse health effect is expected to occur. If this value exceeds unity (1.0), there is a potential health risk associated with exposure to that particular chemical. This risk estimate is not a mathematical prediction of the severity of toxic effects; it is simply a numerical indicator of the possibility of the occurrence of noncarcinogenic effects. The overall potential for the occurrence of effects is assessed by summing the risks to individual chemicals. The resulting summation is the Hazard Index. This approach assumes additive dose and effects for all contaminants.

Carcinogenic risk estimates are provided in the form of incremental cancer risks and are determined by multiplying the potency factor for a specific carcinogen by the intake level. The resulting number (risk) is a unitless expression of an individual's incremental likelihood of developing cancer as a result of exposure to the carcinogenic indicator chemicals. An incremental cancer risk of 1×10^{-6} indicates that an exposed individual has a $1/1 \times 10^{6}$ (or 1 in 1 million) chance of contracting cancer.

Total carcinogenic risks for multiple compounds are presented as the summation of the risks for the individual contaminants. Calculating risks in this manner assumes that individual intakes are small, that there are no antagonistic/ synergistic effects between chemicals, and that all chemicals produce the same result (i.e., cancer). Cancer risks from various exposure routes are also additive, if the exposed populations are the same.

The cumulative incremental cancer risk for groundwater inhalation and ingestion for adult receptors under the two exposure scenarios and existing conditions are as follows:

Existing Condition	2.8×10^{-9}	
Future Worst Case	3.2×10^{-1}	(Maximum Concentrations of Contaminants)
Future Plausible Case	4.7×10^{-5}	(Maximum Concentrations of Contaminants)

The major components of the incremental cancer risk result from the presence of PCE and TCE.

Noncarcinogenic effects are unlikely under current conditions since the hazard index is well below 1.0. Noncarcinogenic effects would be quite likely under the future worst case conditions. The major component of the potential noncarcinogenic effect is PCE. Under the future plausible case scenario the hazard indices do not exceed unity.

In conclusion, both the Hazard Indices and incremental cancer risk estimates reveal that groundwater contamination at the Kellogg Deering Well Field would pose a significant threat to the public health if not for the dilution offered by the Norwalk River and the removal of contaminants by the existing treatment system (i.e., the air stripper). The contamination in the aquifer in the vicinity of the source area is outside the EPA risk range of 10^{-4} to 10^{-7} and poses a threat to human health in the event it was used for private water supply wells.

Although the risks based on the maximum observed concentrations may be overestimates under present site conditions, it is anticipated that continued migration of contaminants to the Well Field could result in a long-term threat to the public health. In the event the contaminated groundwater was used for private water supply it could pose a risk to human beings. The risks generated using arithmetic average and geometric mean concentrations may be better estimates of future risks in the near term. However, based on the concentrations encountered in the source area and evidence suggesting the presence of a Dense Non-Aqueous Phase Liquid below the complex, it is considered possible that the well field concentrations could attain levels approaching the source concentrations over the long-term. In this respect, the contaminated bedrock groundwater at the complex could act as a continuous source of downgradient contamination. In the event that the dilution offered by the river is removed (as a result of silting, prolonged dry weather, or other unforeseen circumstances) or the stripper removal efficiency is impeded (as a result of fouling or equipment failure), it is possible that Well Field production would have to be discontinued.

Soil

Chemical contaminants in the soils below buildings and the parking lot in the complex area currently present no health risk from exposure through direct contact or incidental ingestion of contaminated soil. The potential does exist for human inhalation of contaminants that are being released from soils beneath the complex to the air within the buildings. The levels of contaminants measured during one sampling event are well within the standards set for industrial safety by the Federal Occupational Safety and Health Administration. However, the risks in the Elinco building from exposure to these levels (4.0×10^{-4}) exceeds the Superfund target risk range (10^{-4} to 10^{-7}) using a reasonable worst case scenario. If, in the future, the buildings were demolished and/or soil excavated, the potential risks to public health and the environment would increase substantially. Finally, contamination in the soils will continue to leach into groundwater under the complex and further contribute to groundwater contamination unless the levels of contamination in the soils is reduced.

No significant levels of contaminants were found in either surface water or sediments during the initial Remedial Investigation, so no further sampling or risk assessment was performed during the supplemental Remedial Investigation.

A complete discussion of Site risks can be found in Section 6 of the supplemental Remedial Investigation. Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

EPA published a Proposed Plan for remediation of the Site on July 26, 1989. The preferred alternative consisted of a source control component and a management of migration component. The source control component consisted of the treatment of contaminated soils at the complex using in-situ vapor extraction. The management of migration portion of the Proposed Plan covered alternatives for the treatment of contaminated groundwater. In developing the management of migration components, the area of groundwater contamination at the site was divided into two zones, the Source Area and Downgradient Area, according to the concentration levels found in the supplemental RI. The Source

Area is characterized by TCE concentrations greater than 6,600 ug/l and consists of an area that includes most of the complex as well as an adjacent area extending 400 feet west and about 500 feet southeast of the complex. See Figure 4. The Downgradient Area consists of the remainder of the TCE groundwater plume in excess of 5 ug/l, the Safe Drinking Water Act maximum contaminant level (MCL) for TCE. The Downgradient Area as mapped in the supplemental FS extends westward either to the Norwalk River or, where influenced by the pumping of the Kellogg-Deering Wells, under and beyond the Norwalk River. The management of migration component of the preferred alternative included the extraction and treatment of groundwater from both the Source Area and Downgradient Area. The Proposed Plan indicated that there were four potential treatment technologies for groundwater, including air stripping, carbon adsorption, ultraviolet uv/chemical oxidation and steam stripping. The Proposed Plan also stated that air stripping was the likely choice of treatment technologies in the ROD. All four treatment technologies would involve: 1) the installation of wells to extract contaminated groundwater at the site; 2) the pretreatment of extracted groundwater to remove suspended solids and metals that could reduce the effectiveness of the principal treatment unit; 3) the treatment of contaminated groundwater to remove VOCs; and 4) the discharge of treated groundwater.

The Proposed Plan indicated that the disposal method for the treated groundwater would be determined during the design phase and would consist of either discharge to the local publicly owned treatment works (POTW), discharge to the Norwalk River through a new pipe, discharge to the Norwalk River through existing storm sewers or reinjection into the aquifer, either solely or in combination. The Proposed Plan also stated that if after an adequate period of performance of the preferred alternative, complete restoration of the bedrock aquifer was determined to be technically impracticable, then EPA would consider amending the Record of Decision to waive applicable or relevant and appropriate requirements (ARARs) in the aquifer. In addition, the Proposed Plan stated that the cleanup goals may be adjusted if chemical contaminant concentrations reach a constant value and contaminants are no longer being removed at significant levels.

The remedy selected in this ROD adopts the same source control component that was presented in the Proposed Plan. For the management of migration component, however, this ROD contains the following changes:

* Extraction and treatment of Source Area groundwater only will occur pursuant to this ROD; EPA will make a decision regarding remediation of the Downgradient Area as a separate operable unit at a later date;

- Air stripping has been chosen as the groundwater treatment technology for Source Area groundwater; and

- EPA will consider, during the design phase, the use of either ultraviolet(UV)/chemical oxidation, carbon adsorption or steam stripping as alternative groundwater treatment technologies for Source Area groundwater if it can be shown that the proposed alternative technology will meet the four statutory criteria for CERCLA cleanups and will provide a similar balance in the nine evaluation criteria as air stripping.

Each of the changes listed above will be discussed in turn in the remainder of this section.

EPA has determined that the construction of a new highway, Route 7, will impede the performance of remedial design activities in the near future in the Downgradient Area. Therefore, in order to avoid any delay in remedial actions for contaminated soil and Source Area groundwater, EPA has decided to postpone a decision on remediation of the Downgradient Area until a later date. Remediation of the Downgradient Area will constitute a third operable unit for the site. The selection of a remedy in the Downgradient Area will depend on several factors which may include 1) the effectiveness of the Source Area groundwater extraction and treatment system in remediating contamination in the Downgradient Area groundwater, 2) any future data indicating that the contamination plume at the site is having a negative impact on the Norwalk River and 3) accessibility of the Downgradient Area after the construction of Route 7 is complete.

In addition, many individuals raised issues during the public comment period which challenged the effectiveness and protectiveness of extracting and treating groundwater from the Downgradient Area. While it is EPA's intent to address the contamination in the Downgradient Area groundwater, EPA does see merit in further evaluating options for remediating this area while implementing the Source Area cleanup. Therefore, EPA has decided to refrain from making a decision on a remedy for the Downgradient Area until the concerns raised during the public comment period can be more fully evaluated.

As a result of its decision to create a third operable unit to address the Downgradient Area, EPA will not evaluate Alternatives III, IV, VII and VIII in this Record of Decision because these alternatives differ from Alternatives I, II, V and VI only with regard to the inclusion of the Downgradient Area groundwater extraction and treatment system. All significant comments submitted to EPA during the July 27, 1989 to August 25, 1989 public comment period that pertain to the Downgradient Area groundwater extraction system will be more thoroughly responded to at the time a final decision is made on remediation of the Downgradient Area.

As mentioned above, EPA has decided to address the Downgradient Area as a separate operable unit. EPA believes that this approach is environmentally sound and logical for several reasons: the highest levels of contamination at the site are associated with the Source Area; cleanup of the Source Area will prevent the further migration of contaminants from the Source Area into the Downgradient Area; and further evaluation of the impact of Source Area remediation on Downgradient Area remediation will ensure that the Downgradient Area cleanup will be protective and effective.

The Proposed Plan indicated that there exist four potential groundwater treatment technologies for the site, including, air stripping, ultraviolet(UV)/chemical oxidation, carbon adsorption or steam stripping. EPA has chosen air stripping as the groundwater treatment technology for Source Area groundwater in this ROD because it will meet EPA's cleanup goals, will provide overall protectiveness of public health and the environment, will provide long and short term effectiveness, is implementable, will provide reduction of toxicity, mobility and volume and is cost effective. EPA will consider, during the design phase, the use of either ultraviolet (uv)/chemical oxidation, carbon adsorption or steam stripping as alternative groundwater treatment technologies for Source Area groundwater if it can be demonstrated that another alternative will meet the four statutory requirements for cleanups under CERCLA and will provide a similar balance of the nine evaluation criteria as air stripping. Any decision to utilize one of these alternative treatment technologies will be documented and an explanation of significant differences issued, if appropriate.

The Proposed Plan suggested that EPA would reevaluate the remedy if after an adequate period of performance of the remedy complete restoration of the aquifer is determined to be technically impracticable and that cleanup goals might be readjusted if chemical contaminant concentrations reach a constant value and are no longer being removed at significant levels. EPA is not including these reevaluations as a part of this ROD. This remedy will attain EPA's cleanup goals, will meet ARARs and assure protectiveness of human health and the environment. EPA, retains the right to amend this Record of Decision or change its decision on the remedy for the Source Area, as provided by CERCLA.

None of the changes presented in this ROD differ significantly from those presented in the Proposed Plan. Furthermore, to the extent that differences exist, they are the logical outgrowth of the Proposed Plan and were reasonably forseeable. The Agency does not believe that it is necessary to reissue the Proposed Plan for further comment and provides the following rationale: 1) the supplemental Feasibility Study and the Proposed Plan discussed the alternatives of proceeding with Source Area groundwater extraction and treatment only and source area soil treatment only; 2) the public already had an opportunity to comment on this alternative, which is merely a different combination of a source component and management of migration component which were already evaluated in the FS; 3) the supplemental Feasibility Study and the Proposed plan discussed the alternatives of air stripping; 4) the suggested changes, do not alter the overall remedial objectives for the Site, as presented below; and 5) the eventual decision on remediation of the Downgradient Area will again be subject to public comment.

DEVELOPMENT AND SCREENING OF ALTERNATIVES

Statutory Requirements/Response Objectives

Prior to the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), actions taken in response to releases of hazardous substances were conducted in accordance with CERCLA as enacted in 1980 and the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, promulgated in the Federal Register on November 20, 1985. Although EPA proposed revisions on December 21, 1988, to the NCP to reflect SARA, until those proposed revisions are finalized, the procedures and standards for responding to releases of hazardous substances, pollutants and contaminants shall be in accordance with Section 121 of CERCLA and, to the maximum extent practicable, the current NCP.

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a statutory preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances over remedies that do not achieve such results through treatment. Response alternatives were developed to be consistent with these Congressional mandates.

A number of potential exposure pathways were analyzed for risk and threats to public health and the environment in the Risk Assessment and Indoor Air Addendum to the supplemental Remedial Investigation report. Guidelines in the Superfund Public Health Evaluation Manual (EPA, 1986) regarding development of risk analyses for remedial alternatives were used to assist EPA in the development of response actions. As a result of these assessments, remedial response objectives were developed to mitigate existing and future threats to public health and the environment. These response objectives are:

1. Treat soils to minimize the risk from exposure by direct contact with the contaminants and minimize the leaching of contaminants to the groundwater;

2. Restore the overburden and bedrock aquifers to drinking water standards;

3. Minimize the further introduction of contaminated groundwater from the bedrock aquifer to the overburden aquifer supplying the Kellogg-Deering Well Field;

4. Protect the Norwalk River from the adverse effects of contaminated groundwater discharges; and

5. Prevent exposure to contaminated groundwater.

The remedial objectives listed above are overall objectives for the entire site at the completion of all operable units. The specific remedial objectives for the operable unit associated with this Record of Decision are listed with the discussion of the selected remedy.

Technology and Alternative Development and Screening

CERCLA, the NCP, and EPA guidance documents including, the "Guidance on Feasibility Studies Under CERCLA" dated June 1985, the "Interim Guidance on Superfund Selection of Remedy" [EPA Office of Solid Waste and Emergency Response (OSWER)], Directive No. 9355.0-19 (December 24, 1986), and the Interim Final "Guidance for Conducting RIs and FSs under CERCLA," OSWER Directive No. 9355.3-01, set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements and guidance documents, a range of treatment alternatives were developed for the Site, a containment option involving little or no treatment, and a no-action alternative.

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, EPA is required to consider in its assessment of alternatives. In addition to these factors and the other statutory directives of Section 121 of CERCLA, the evaluation and selection process was guided by the EPA document "Additional Interim Guidance for FY'87 Records of Decision" dated July 24, 1987. This document provides direction on the consideration of SARA cleanup standards and sets forth nine factors that EPA should consider in its evaluation and selection of remedial actions. The evaluation criteria are:

1. Overall Protection of Human Health and the Environment.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs).
3. Long-term Effectiveness and Permanence.
4. Reduction of Toxicity, Mobility or Volume.
5. Short-term Effectiveness.
6. Implementability.
7. Cost.
8. Community Acceptance.
9. State Acceptance.

Chapters 10 and 11 of the supplemental Feasibility Study identified, assessed and screened technologies based on effectiveness, implementability and cost. These technologies were combined into source control (SC) and management of migration (MM) alternatives. The purpose of the initial screening was to narrow the number of potential remedial actions for further detailed analysis while preserving a range of options.

In Chapter 12 of the supplemental Feasibility Study, the "Detailed Analysis of Overall Remedial Action Alternatives," remedial alternatives are developed by combining the technologies identified in the previous screening process into the categories required by OSWER Directive No. 9355.3-01. This process involves combining the source control component with the Source Area and Downgradient Area management of migration components and no-action to produce a range of remedial alternatives. Table 2 displays the eight Remedial Alternatives that undergo the detailed analysis.

DESCRIPTION OF ALTERNATIVES

This section presents a narrative summary and brief evaluation of the alternatives that do not involve management of migration components in the Downgradient Area. The alternatives which incorporate treatment of groundwater in the Downgradient Area (i.e. Alternatives III, IV, VII and VIII) are not described in this Record of Decision because EPA is not making a formal decision regarding remediation of the Downgradient Area at this time.

The summaries below include brief evaluations of the first seven of the nine evaluation criteria described above. The last two criteria, State and Community Acceptance, are described later during the comparative analysis of alternatives. Table 12-20 of the supplemental Feasibility Study presents a detailed tabular assessment of each of the original eight alternatives. Table 12-20 is supported by text in Chapter 12 of the supplemental Feasibility Study.

In October of 1987, Elinco and the Connecticut Department of Environmental Protection (DEP) entered into a consent agreement to implement a groundwater extraction and treatment system within the boundaries of the complex. This system, composed of four extraction wells, is presently under construction. Elinco's extraction system was not considered in EPA's supplemental Feasibility Study because the Elinco system was under design at the time of the supplemental Feasibility Study's writing. Alternatives described in the supplemental Feasibility Study and below that involve no action for Source Area groundwater (i.e., Alternatives I and V) do not include the Elinco extraction system. Alternatives that involve Source Area groundwater treatment (i.e., Alternatives II and VI) would involve an evaluation by EPA of the Elinco extraction system during Remedial Design.

Alternative I: No Action

Alternative I, the no action alternative, means leaving the site in its present condition. This alternative does not include the remediation system to be undertaken by Elinco Associates. Contaminated soils would not be treated. Long term institutional controls including restrictions on deeds, building permits and private wells would be enacted. Aquifer restoration would rely primarily on natural aquifer flushing because only a portion of the contaminants in the groundwater would be intercepted and treated by operations at the Kellogg-Deering Well Field. The remainder of the contaminants in the groundwater outside of the effective pumping radius of the Kellogg-Deering Well Field would either persist in dead end bedrock fractures or migrate through the aquifer and eventually discharge into the Norwalk River. In addition, contaminants in soils of the unsaturated zone at the complex could percolate downward to the water table if infiltration was not prevented by the buildings and parking lots.

Environmental monitoring of groundwater and of indoor air within the buildings at the complex would occur indefinitely. This monitoring would be implemented to aid in identifying potential receptors and minimize potential health risks. Details of the monitoring program would be developed in the Remedial Design phase.

Alternative I would not provide overall protection of human health and the environment because no cleanup of contaminants in soils and groundwater would occur and further release of contaminants to groundwater from soils would not be minimized. Alternative I is implementable and would provide short term effectiveness. However, long-term institutional controls including restrictions on deeds, building permits and private wells would be needed. There would be no reduction of the mobility, toxicity and volume of contaminants in the unsaturated soils of the complex. The mobility of the contaminants in groundwater would not be reduced. The toxicity and volume of contaminated groundwater would not be reduced except by well head treatment. Alternative I would not provide long-term effectiveness or permanence or achieve groundwater quality ARARs.

Estimated Capital Cost: $0
Estimated Operations and Maintenance Cost (net present worth): $240,000
Estimated Total Cost $240,000

Alternative II: Groundwater Treatment of Source Area

Alternative II was developed for the purpose of controlling the contaminant migration only in the Source Area which is the most heavily contaminated portion of the aquifer. This system, would involve intercepting contaminated groundwater to the maximum extent practicable in the Source Area. The contaminated groundwater would be treated by air stripping and discharged offsite. An evaluation of the Elinco wells to remediate the contamination within the complex boundaries would be part of predesign activities. Contaminated soils would not be treated. Long term institutional controls, including restrictions on deeds building permits and private wells, would be enacted.

Alternative II would reduce the overall mass of contaminants in the bedrock aquifer and eventually reduce the input of contaminants into the overburden aquifer in the vicinity of the Norwalk River. Contaminants in soils of the unsaturated zone at the complex could percolate downward to the water table if infiltration were prevented by the buildings and parking lots.

Monitoring of indoor air within the buildings at the complex would occur indefinitely to minimize potential health risks. Groundwater monitoring would occur in both the Source and Downgradient Areas to evaluate the progress of the remedy. Details of the monitoring program would be developed in the Remedial Design phase and will include at a minimum, overburden and bedrock monitoring wells.

Alternative II would provide protection of human health and the environment through the cleanup of contaminants in Source Area groundwater. Alternative II would comply with groundwater ARARs, but not soil ARARs. The groundwater treatment component of Alternative II would substantially reduce the toxicity and volume of contamination. The mobility of contaminants would be reduced by the extraction wells. Since Alternative II does not include soil treatment, mobility, toxicity and volume of contaminants in soils would not be reduced.

Alternative II is implementable and would provide short term effectiveness. Alternative II would provide limited long-term effectiveness or permanence because soil contamination would continue to contribute to the groundwater in the Source Area.

The time required to attain the groundwater cleanup goals cannot be estimated with precision since volatile organic compounds are expected to be present as dense non-aqueous phase liquids in bedrock fractures.

Estimated Time for Completion Including Design, Bidding, Construction and Operation: Exceeds 10 years
Estimated Capital Cost: $4,600,000
Estimated Operations and Maintenance Cost (net present worth): $3,100,000
Estimated Total Cost $7,700,000

Alternative III: Groundwater Treatment of Source and Downgradient Areas

Alternative III would involve groundwater treatment of the Source Area and the Downgradient Area without treatment of soils at the complex. This alternative is not being considered in this Record of Decision because EPA has decided not to issue a final decision on the Downgradient System at this time. Alternative III, minus the Downgradient System, is essentially the same as Alternative II which is considered in this Record of Decision. The reasons for not including the Downgradient System in this Record of Decision can be found above in the Documentation of Significant Changes section.

Alternative IV: Groundwater Treatment of Downgradient Area

Alternative IV would involve groundwater treatment of the Downgradient Area without groundwater treatment of the Source Area or treatment of soils at the complex. This alternative is not being considered in this Record of Decision because EPA has decided not to issue a final decision on the Downgradient System at this time. Alternative IV, minus the Downgradient System, is essentially the same as Alternative I, the no action alternative, which is considered in this Record of Decision. The reasons for not including the Downgradient System in this Record of Decision can be found above in the Documentation of Significant Changes section.

Alternative V: Soil Treatment

Alternative V would involve treatment of contaminated soils only. Groundwater would remain much the same as described in Alternative I, the no action alternative. The in-situ soil vacuum extraction system would utilize unsaturated zone extraction wells, vacuum pumps, associated piping and vapor treatment. The vacuum extraction process develops a vacuum in the unsaturated zone which induces contaminant flow in the form of a vapor. The contaminant-bearing vapor is forced through the soil matrix to extraction wells and withdrawn. The process essentially air-strips volatile organic compounds from the soils due to the mass transfer of contaminants to the soil vapor. Moisture is removed from the contaminated soil vapor in a condenser or separator. Vapors are then drawn through activated carbon beds where volatile organic contaminants are absorbed before discharging the clean air into the atmosphere in compliance with Federal and State standards. The separated water will be treated and discharged.

Alternative V would remove contaminants from soils of the unsaturated zone below the complex thereby reducing further the upward migration of contaminants into the indoor air of the complex buildings. If in the future the buildings and parking lots were ever removed, Alternative V would reduce the increased potential for downward migration of contaminants to groundwater and would minimize the potential human health risk from exposure to contaminated soils.

Periodic sampling and analysis of indoor air within the buildings at the complex would occur to monitor the progress of soil remediation. Wellhead gases, process gases and gas emissions would be monitored throughout the period of operation to measure the effectiveness of the vacuum extraction system. The progress of the remedy would also be measured by a monitoring well network. Details of the soil vapor monitoring program would be developed during the Remedial Design phase.

Groundwater monitoring in both the Source and Downgradient areas would be needed indefinitely. Details of the monitoring program would be developed in the Remedial Design phase.

Alternative V would provide protection of human health and the environment through the cleanup of contaminated soils and by minimizing the release of contaminants to the underlying groundwater. The mobility, toxicity and volume of contaminated groundwater would not be reduced by Alternative V. The mobility, toxicity and volume of soil contaminants would be reduced by the soil vapor extraction and treatment.

Alternative V is implementable and would provide short term effectiveness. Due to the fact that contaminants would remain in groundwater, institutional controls would need to be enacted during and after the time of in-situ soil vacuum extraction treatment. These institutional controls would include restrictions on deeds and building permits.

Alternative V would neither attain groundwater ARARs nor provide long-term effectiveness or permanence because groundwater contamination would persist. Additionally, the levels of contamination may increase in the downgradient areas of the plume which could potentially impact the ecosystems in Deering Pond and the Norwalk River.

Soil remediation at the complex using in-situ vacuum extraction would take approximately 2.5 years. However, the ability of VOC contaminants to move upward in soils from groundwater would likely extend the remediation time than would be the case for soil treatment conducted concurrently with source area groundwater treatment.

Estimated Time for Completion Including Design, Bidding, Construction and Operation: 2.5 years
Estimated Capital Cost : $1,400,000
Estimated Operations and Maintenance Cost (net present worth): $200,000
Estimated Total Cost $1,600,000

Alternative VI: Soil and Source Area Groundwater Treatment

Alternative VI was developed to control the contaminant migration in the Source Area, the most heavily contaminated portion of the aquifer, and remove contaminants from soils at the complex. The groundwater system would be essentially the same as described for Alterative II, that is, it would involve intercepting contaminated groundwater in the Source Area. The contaminated groundwater would be treated by air stripping and discharged offsite. An evaluation of the Elinco wells to control the contamination within the complex boundaries would be a part of predesign activities. Institutional controls including restrictions on deeds, building permits and private wells would be enacted.

The source control component, in-situ vacuum extraction, would be essentially the same as described in Alternative II. The in-situ soil vacuum extraction system would utilize unsaturated zone extraction wells, vacuum pumps, associated piping and vapor treatment. The vacuum extraction process develops a vacuum in the unsaturated zone which induces contaminant flow in the form of a vapor. The contaminant bearing vapor is forced through the soil matrix to extraction wells and withdrawn. The process essentially air-strips volatile organic compounds from the soils due to the mass transfer of contaminants to the soil vapor. Moisture is removed from the contaminated soil vapor in a condenser or separator. Vapors are then drawn through activated carbon beds where volatile organic contaminants are absorbed before discharging the clean air into the atmosphere in compliance with Federal and State requirements. The separated water will be treated and discharged.

Alternative VI would reduce the overall mass of contaminants in the bedrock aquifer and, over the long term, reduce the input of contaminants into the overburden aquifer in the vicinity of the Norwalk River.

Contaminants would be removed from soils of the unsaturated zone at the complex which would further aid the groundwater restoration effort, reduce the upward migration of contaminants into the indoor air of the buildings of the complex, and reduce human health risks if the buildings were ever removed and soils became exposed. Periodic sampling and analysis of groundwater, soil vapor and indoor air would be required to monitor the progress of the cleanup. Details of the monitoring program would be developed in the Remedial Design phase.

Alternative VI would provide protection of human health and the environment because cleanup of contaminants in soils and groundwater would occur and further release of contaminants to groundwater from soils would be minimized. Treatment of the extracted water and soil gas under Alternative VI will substantially reduce the overall toxicity and volume of site contamination. Alternative VI would reduce the mobility of contaminants in the saturated or unsaturated zones through the use of extraction wells.

Alternative VI is implementable and would provide short term effectiveness. Alternative VI would provide long-term effectiveness or permanence because both Source Area groundwater and contaminated soils would be addressed.

Soil remediation at the complex using in-situ vacuum extraction would take approximately 2.5 years. The time required to attain the groundwater cleanup goals cannot be estimated with precison since volatile organic compounds are expected to be present as dense non-aqueous phase liquids in bedrock fractures.

Estimated Time for Completion Including Design, Bidding, Construction and Operation: Exceeds 10 years
Estimated Capital Cost : $6,000,000
Estimated Operations and Maintenance Cost (net present worth): $3,000,000
Estimated Total Cost $9,000,000

Alternative VII: Soil and Groundwater Treatment

Alternative VII would involve groundwater treatment of the Source and Downgradient Areas and treatment of soils at the complex. This alternative was EPA's Preferred Alternative in the July 1989 Proposed Plan, but is not being considered in this Record of Decision because EPA has decided not to issue a final decision on the Downgradient System at this time. Alternative VII, minus the Downgradient System, is essentially the same as Alternative VI, the selected alternative. The reasons for not including the Downgradient System in this Record of Decision can be found above in the Documentation of Significant Changes section.

Alternative VIII: Soil and Downgradient Area Groundwater Treatment

Alternative VIII would involve groundwater treatment of the Downgradient Area and treatment of soils at the complex. This alternative is not being considered in this Record of Decision because EPA has decided not to issue a final decision on the Downgradient System at this time. Alternative VIII, minus the Downgradient System, is essentially the same as Alternative V which is considered in this Record of Decision. The reasons for not including the Downgradient System in this Record of Decision can be found above in the Documentation of Significant Changes section.

SELECTED REMEDY

The selected remedy is Alternative VI which consists of in-situ vacuum extraction for soils; pumping, treating and discharging of contaminated groundwater in the Source Area; and implementation of institutional controls.

The overall goal of the cleanup action at the Kellogg-Deering Well Field Superfund Site is to restore the groundwater in the aquifer to its beneficial uses (or health based levels) within a reasonable period of time. The selected remedy for the second operable unit is a comprehensive approach to Source Area remediation that combines components of source control and management of migration.

Remedial Action Objectives/Cleanup Goals

The selected remedy was developed to satisfy the following remedial objectives which will guide the design of the remedy and be used to measure the success of the remedy.

Groundwater - The remedial objectives for contaminated groundwater at the Source Area are as follows:

* Prevent further introduction of contaminated ground water from the Source Area to the Downgradient Area and ultimately to the production wells at the Kellogg-Deering Well Field and the Norwalk River.

* Restore the Source Area aquifer to drinking water quality.

* Reduce the mass of contaminants at the Source Area.

* Prevent human consumption of or contact with contaminated ground water above the cleanup goals presented in this ROD.

EPA believes that active restoration of the groundwater is appropriate for the Kellogg-Deering Well Field Superfund Site. The groundwater cleanup levels at the site are primarily based upon the classification of the groundwater as a current drinking water source. Therefore, the Maximum Contaminant Levels promulgated under the Safe Drinking Water Act are relevant and appropriate to the aquifer.

EPA's decision to attempt restoration of the groundwater at the site to drinking water standards is based on several factors. In addition to the requirement to attain Federal and State ARARs, EPA considered its Groundwater Protection Strategy (Office of Groundwater Protection, August 1984) which provides guidance concerning how different groundwaters throughout the country should be classified and to what extent cleaning up a particular class of groundwater is appropriate. The policy under the Groundwater Protection Strategy establishes groundwater protection goals based on "the highest beneficial uses to which groundwater having significant water resources value can presently or potentially be put." Guidelines for protection of aquifers are differentially based, relative to characteristics of vulnerability, use and value. Under the Groundwater Protection Strategy classification, the groundwater at the Kellogg-Deering Well Field Superfund Site is considered to be Class II-A, a current drinking water source.

EPA also considered the Agency's Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites (December 1988). This guidance directs the Agency to consider a 10^{-4} to 10^{-7} range of risk levels in selecting the appropriate risk level for the groundwater at the site. The Source Area groundwater will be pumped and treated until MCLS are met. At that point in time, groundwater will be sampled to determine if the cumulative carcinogenic risk falls within a range generally considered by EPA to be protective at Superfund sites and does not exceed unity on the Hazard Index. If the level of risk does not fall within EPA's risk range or exceeds unity on the Hazard Index, then additional treatment will be conducted in order to meet EPA's risk levels. A supplementary decision document will be issued, as appropriate.

The area of attainment for the groundwater goals shall be at every point within the Source Area. The groundwater cleanup goals are presented in Table 3.

Soil - The remedial objectives for contaminated soil at the complex are as follows:

- Prevent public contact with contaminated soils above cleanup goals.

- Prevent leaching of contaminants to the groundwater at values that affect the quality of groundwater.

Soil cleanup goals were developed in order to reduce the potential future risk to public health and the environment and to protect groundwater. The soil cleanup levels presented in Table 3 are calculated by using a soil leaching model in order to achieve the target groundwater levels. This approach utilizes a soil/water sorption coefficient which describes the distribution of an indicator chemical between soil and groundwater at equilibrium. The type of soils and amount of organic carbon present in the soils have a large impact on the amount of contamination that will be attenuated in those soils and, therefore, unable to migrate and contribute to groundwater contamination. The soil cleanup levels listed in Table 3 are presented as ranges because the soil types differ within the area of soil contamination. Further soil sampling and analysis will be undertaken during Remedial Design to refine the soil cleanup levels. A more complete description the soil leaching model can be found in Section 6 of the supplemental RI.

Description of Components of the Selected Remedy

EPA's selected remedy consists of source control through the implementation of in-situ vacuum extraction at the Elinco/Pitney Bowes/Matheis Court Complex, management of migration through implementation of groundwater pumping, treatment and discharge for the Source Area, and institutional controls to prevent potential exposure to contamination during implementation of the remedy. Institutional controls will involve restrictions on soil excavation in areas of soil contamination and restrictions on well installations in areas of groundwater contamination. If EPA cannot obtain the required institutional controls, EPA will consider treatment technologies that do not require institutional controls.

Contaminated Soil Treatment - The source control component will involve designing, installing, operating and maintaining a soil vapor vacuum extraction system in the unsaturated zone at the Elinco/Pitney Bowes/Matheis Court Complex which will intercept laterally and vertically all areas of subsurface soil contamination so as to attain the soil cleanup goals presented above and in Table 3. The area of attainment for the soil cleanup goals will be everywhere on the complex property.

The vacuum extraction system will utilize extraction, injection and monitoring wells. It is anticipated that extraction wells would be located in or near the three processing areas of the two Zell and Elinco Buildings as well as in the two exterior corridors. The number and location of these wells will be finally determined during design. Each of the extraction wells will be surrounded by approximately 15 passive air injection wells.

The vacuum extraction system will utilize carbon adsorption for vapor treatment for protectiveness consistent with OSWER Directive 9355.0-28 and Region I guidance. The contaminated water from the separator will be treated as necessary and discharged in accordance with the discharge limitations required by the chosen groundwater discharge method as described below.

Predesign work will include sampling to refine the volume of soil to be treated. This sampling program will include analysis for total organic carbon so that soil cleanup goals can be better refined in accordance with the soil leaching model described above.

An adequate and effective sampling and analysis program will be designed and implemented to monitor the performance of the vacuum extraction system recovery and treatment and process gas discharges. It is currently estimated that the soil cleanup goals can be achieved within 2.5 years for the estimated 44,000 cubic yards of contaminated soils. Consideration will be given to sequencing soil and groundwater remedial components to avoid recontamination of soil from contaminated groundwater. Completion monitoring will also be conducted. The costs associated with this source control component are listed in Table 4.

__Contaminated Groundwater Extraction and Treatment__ - The Management of Migration component will include designing, installing, operating and maintaining a groundwater extraction, treatment and disposal system for the Source Area shown in Figure 4. The remedial action would be combined with institutional controls consisting of restrictions on the installation and use of private wells in the area of groundwater contamination in the Source and Downgradient Areas. The costs associated with this Management of Migration component are listed in Table 4.

The Source Area extraction system will utilize two remediation well networks. One remediation well network will be located at the complex property. EPA will evaluate during design the groundwater treatment system currently being constructed by Elinco at the complex to determine if some, or all, of that system may be incorporated in the groundwater treatment system required by this Record of Decision. The second remediation well network will be installed near the center of the Source Area contamination near the railroad tracks west of Main Ave in Norwalk. Extraction wells at this network will be installed to capture contaminants along the entire width of the groundwater contamination plume at the railroad tracks. The remediation well networks together may include as many as 25 wells, possibly more, to remove contaminants from both the overburden and bedrock aquifers. Bedrock wells may extend as far as 250 feet or more below ground surface. Extraction rates for the system have been estimated at approximately 370 gallons per minute. The specific pumping rates, number of wells and locations of wells will be developed during design.

Air stripping will be utilized to treat the groundwater to remove VOCs. The system would utilize carbon adsorbtion for vapor treatment for protectiveness consistent with OSWER Directive 9355.0-8 and Region I guidance. Pretreatment to remove solids may be required prior to air stripping. Any pretreatment sludge will be tested to determine if it is subject to RCRA and the RCRA Land Disposal Restrictions. The sludge will be managed in compliance with RCRA and the Land Disposal Restrictions if they are applicable.

The Proposed Plan indicated that four different treatment technologies could potentially be used to address groundwater contamination at the site. These include air stripping, ultraviolet (uv)/Chemical Oxidation, carbon adsorption and steam stripping. EPA's chosen groundwater treatment method in this ROD is air stripping. EPA will consider, during the design phase, the use of ultraviolet (uv)/chemical oxidation, carbon adsorption or steam stripping as alternative groundwater treatment technologies for Source Area groundwater if it can be demonstrated that these alternatives will meet the four statutory requirements for cleanups under CERCLA and will provide a similar balance of the nine evaluation criteria as air stripping.

The Proposed Plan indicated that a decision on the discharge option for treated groundwater would be made during the design phase from among four options. These options include discharge to the local publicly owned treatment works, discharge to the Norwalk River through a new pipe, discharge to the Norwalk River through existing storm sewers or reinjection into the aquifer, either solely or in combination. A decision among these discharge options will be made on the basis of the statutory and regulatory criteria for CERCLA cleanups. This decision will be issued in a supplementary decision document.

Predesign activities will include at a minimum: 1) comprehensive groundwater sampling to refine and confirm the nature and extent of contamination at the site in both the bedrock and overburden; 2) an evaluation of the adequacy of the Elinco groundwater extraction system to control the groundwater contamination within the complex boundaries; 3) an evaluation of the need for pretreatment (as described above) of extracted groundwater prior to air stripping; 4) pump tests to determine well yields, remediation pumping rates, and location and number of extraction wells; and 5) bench and pilot testing of the presented and/or proposed treatment technologies.

Groundwater monitoring of the overburden and bedrock aquifers within the Source Area, and the Downgradient Area will occur during implementation of the remedy in order to determine compliance with the cleanup goals. A specific monitoring program will be developed during design that will include overburden and bedrock monitoring wells including, at the least, those wells that have been installed as part of the remedial investigation. Monitoring wells will be sampled at least quarterly. Treatment system influent and effluent concentrations will be monitored at least once per day. The objectives of monitoring are to define the mass of contaminants extracted over the life of the remedy, to evaluate the efficiency of the remedy, and to ensure compliance with appropriate Federal and State requirements.

Pumping rates at each extraction well will be monitored during the course of the remedial action. An adequate array of piezometers will be installed to adequately measure in three dimensions the hydraulic gradient between adjacent pumping wells to insure an inward hydraulic gradient is maintained at each remediation well network and that no portion of the plume is free to migrate from the Source Area. Extraction wells may need to be repositioned occasionally to maximize the extraction efficiency.

Remediation of the Source Area can involve the intermittent operation, or pulse pumping, of the remediation well fields to improve the efficiency of contaminant removal. The purpose of the pulse pumping is to allow a sufficient resting phase between pumping phases when 1) contaminants can diffuse out of low permeability zones and into adjacent high permeability zones, 2) maximum concentrations can be achieved in high permeability zones, or 3) non aqueous phase liquid residuals can reach equilibrium concentrations. As a result, active phases will remove a minimum amount of contaminated groundwater at maximum possible concentrations. The cycle of pumping and resting will continue for each extraction well until it is determined that contaminant levels in the extraction wells are not rising above the cleanup goals for individual contaminants. At that point in time, groundwater will be sampled to determine if the cumulative carcinogenic risk falls within a risk range generally considered by EPA to be protective at Superfund sites and does not exceed unity on the Hazard Index. If the level of risk does not fall within EPA's risk range or exceeds unity on the Hazard Index, then additional treatment will be conducted in order to meet EPA's risk levels. A supplementary decision document will be issued as appropriate.

A completion monitoring program will be implemented which will consist of quarterly monitoring for three years. The completion monitoring program will be defined during design and refined during the remedy implementation. The completion monitoring program may require the installation of additional wells. This program will be implemented at the point the cleanup goals are achieved at all wells that are part of the implementation program.

To the extent required by law, EPA will review the Site at least once every five years after the initiation of remedial action at the Site if any hazardous substances, pollutants or contaminants remain at the Site to assure that the remedial action continues to protect human health and the environment. EPA will also evaluate risk posed by the Site at the conclusion of the completion monitoring program to guarantee it is protective (i.e., before the Site is proposed for deletion from the NPL).

Rationale for Selection

The rationale for choosing the selected alternative is based on an assessment of each criteria listed in the evaluation of alternatives section of this document. In accordance with

Section 121 of CERCLA, to be considered as a candidate for selection in the ROD, the alternative must have been found to be protective of human health and the environment and able to attain ARARs unless a waiver is invoked. In assessing the alternatives that met these statutory requirements, EPA focused on the other evaluation criteria, including, short term effectiveness, long-term effectiveness, implementability, use of treatment to permanently reduce the mobility, toxicity and volume, and cost. EPA also considered nontechnical factors that affect the implementability of a remedy, such as state and community acceptance. Based upon this assessment, taking into account the statutory preferences of CERCLA, EPA selected the remedial approach for the Site.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In this section, the four alternatives are compared against each other in relation to the nine evaluation criteria. A more complete comparison of the Alternatives according to these criteria is provided in Table 12-20 and Section 12.3 of the supplemental Feasibility Study.

Overall Protection of Human Health and the Environment

Section 121(d) of CERCLA provides that remedial actions shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment. Alternatives I, II, V and VI provide varying degrees of protection of human health and the environment. Although, institutional controls would be implemented (to prevent excavations in areas of soil contamination and well installations and use in areas of groundwater contamination) under all these alternatives, such institutional controls can fail. Therefore, absent engineering controls, institutional controls fail to provide overall protectiveness. The use of institutional controls to restrict use or access should not substitute for active response measures (e.g. treatment and/or containment of source material, restoration of groundwaters to their beneficial uses) as the sole remedy.

Alternative I, the no-action alternative, would not be protective of human health and the environment because contaminants in the groundwater outside of the effective pumping radius of the Kellogg-Deering Well Field would persist in dead end bedrock fractures or migrate through the aquifer and discharge to the Norwalk River. In addition, contaminants would remain in the soils at the complex and would provide a continuing source of groundwater contamination and soil gases. Alternative I would include institutional controls which, absent engineering controls, fail to provide overall protectiveness.

Alternatives II and VI provide for greater protection of the environment than Alternatives I and V because the groundwater extraction wells will remove significant amounts of contaminants from the aquifer. Alternatives II and VI would thereby reduce the size of the contaminant plume, expedite aquifer restoration, and provide greater overall protectiveness should institutional controls fail. Alternatives I and V would rely on natural flushing for groundwater restoration.

Alternatives V and VI would remove contaminants from soils of the unsaturated zone below the complex thereby reducing further the upward migration of contaminants into the indoor air of the complex buildings. If in the future the buildings and parking lots were ever removed, Alternatives V and VI would reduce the increased potential for downward migration of contaminants to groundwater and would minimize the potential human health risk from exposure to contaminated soils.

Alternative VI would provide the greatest protection of human health and the environment by removing contaminants from soils in the unsaturated zone at the complex and by removing contaminant mass and reducing contaminant concentrations within the bedrock and overburden aquifers in the Source Area.

Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA requires that remedial actions comply with all applicable or relevant and appropriate Federal and State standards, requirements, criteria or limitations that apply to the Site.

Alternatives I and V, the no-action and soil treatment alternatives, rely on aquifer flushing and the treatment system at the Kellogg-Deering Well Field to alleviate groundwater contamination at the site. These alternatives are less likely to assure that groundwater in the Source Area will meet Safe Drinking Water Act MCLs for groundwater within a reasonable timeframe. Alternative VI is more capable of meeting groundwater quality ARARs than Alternative II because the soil treatment component of Alternative VI will reduce the potential for additional leaching of contaminants from the unsaturated zone to the saturated zone.

The air stripping system proposed under Alternatives II and VI are equally capable of meeting Federal and State requirements for air emissions. These systems are also equally capable of treating extracted groundwater to levels required for discharge to surface water or groundwater.

Alternative VI is the most capable of meeting the relevant and appropriate RCRA closure requirement, especially the Closure Performance Standard of 40 CFR Part 264.111

Long-term Effectiveness and Permanence

Long-term effectiveness and permanence addresses the long-term protection and reliability of an alternative and the magnitude of residual risks.

Alternative VI would remove the largest amount of contaminants from the aquifer, would provide the greatest control of migration of contaminants, and would restore the Source Area portion of the aquifer in the shortest period of time. In comparison to Alternatives I, II and V, Alternative VI would be the most capable of all the other alternatives evaluated in this Record of Decision to meet soil and groundwater cleanup goals and thereby provide a permanent remedy.

Long-term environmental monitoring of indoor air and groundwater would be implemented for each alternative to measure effectiveness of the remedy and to identify potential receptors. Institutional controls would be implemented with each alternative, although such controls are not considered a permanent remedy. Alternative VI, which addresses contaminated soils and groundwater in the Source Area, would require the least in terms of long-term institutional controls. Maintaining institutional controls on private well use for the duration of the aquifer restoration period would be more difficult under Alternatives I and V because they would require a greater amount of time to cleanse the aquifer through natural aquifer flushing than with the aid of extraction wells. Maintaining long-term contaminated soil excavation institutional controls would be more difficult under Alternatives I and II.

Alternatives II and VI are capable of removing more contaminants from the Source Area, and at a faster rate than Alternatives I and V, which rely mostly on dilution and natural aquifer flushing. The natural aquifer flushing that would be a part of Alternatives I and V are likely to result in increased contaminant levels in downgradient portions of the groundwater plume before cleansing by flushing is complete. Therefore, Alternatives II and VI would be more effective at restoring the aquifer and reducing the long term risk to potential receptors downgradient. Alternative VI would be more effective than

Alternative II because the soil treatment component of Alternative VI will reduce the potential for additional leaching of contaminants from the unsaturated zone to soils to the saturated zone.

Reduction of Toxicity, Mobility or Volume

This evaluation criterion relates to the ability of a remedial alternative to reduce the toxicity, mobility or volume of hazardous substances at a site and to thereby control the risks associated with such hazardous substances. Reducing the level of toxicity in the aquifer and soils will reduce the public health risk posed to future users of the aquifer should institutional controls fail.

Alternative VI which is the only alternative that addresses both contaminated soil and groundwater would provide the greatest and quickest reduction of mobility, toxicity and volume of contaminants at the site. Under Alternatives II and VI, toxicity and volume of groundwater contaminants would be reduced by the treatment. The mobility of contaminants would be reduced by the extraction wells. Under Alternatives I and V, the toxicity and volume would not be reduced. Alternatives I and V would continue to allow some of the contaminants to continue to migrate downgradient of the Source Area.

Under Alternatives V and VI the toxicity and volume of soil contaminants would be reduced by soil vapor treatment. The mobility of soil contaminants would be reduced by the extraction wells. Under Alternatives I and II, contaminants remaining in the unsaturated zone could possibly migrate upwards into the indoor air of the complex buildings or percolate downward to the water table (if the buildings and parking lots were removed).

Short-Term Effectiveness

The short-term effectiveness criterion relates to the time required to meet remedial objectives, and the impacts of the implementation of the remedy.

The time required to meet the groundwater cleanup goals in the aquifer cannot be determined with specificity for any of the alternatives due to the probable presence of DNAPL's and the complexity of the fractured bedrock system. However, the time required to meet the groundwater cleanup goals would be substantially longer under Alternatives I and V than under Alternatives II and VI, which, in addition to natural aquifer flushing, rely on groundwater extraction wells to actively remove contaminants from the aquifer.

Implementation of Alternative I would have very minor short-term impacts to workers and to the environment. Implementation of Alternatives II, V and VI could pose some risk to workers due to the possible release of contaminant vapors during drilling and installation of soil vapor and/or groundwater wells. This potential for release would pose a minimal risk to the community. Alternatives V and VI would require some coordination with existing industrial activities within the complex buildings during the construction of some of the soil vapor extraction equipment. The short-term adverse impacts associated with Alternative VI would be greatest in comparison to the other alternatives because Alternative VI involves the most construction.

Alternatives II and VI may, if no practicable alternative exists, have short term impacts on wetlands or the floodplain during installation and operation of a discharge pipe or injection wells. All impacts from these activities will be mitigated at the time the remedial action is completed.

Implementability

Implementability addresses the ability to implement and operate each alternative from design through construction and operation and maintenance.

Alternative I would be the easiest to implement since long-term environmental monitoring would be the principle element. Alternatives II, V and VI would be more difficult to implement because these alternatives would have substantially greater design, construction, and operation and maintenance requirements than Alternative I. Also, Alternatives I, V and VI would require trained personnel to perform operation and maintenance activities. Alternative VI would be the most difficult to implement since it includes both an in-situ vacuum extraction system and groundwater extraction system.

The equipment and resources under Alternatives I and II are readily available. The availability of vendors to implement the in-situ vacuum extraction system for Alternatives V and VI is limited.

Cost

The cost evaluation of each alternative is based on the capital cost (cost to construct), long-term monitoring, operation and maintenance (O&M), and present worth costs. Table 5 presents estimates of these costs for Alternatives I, II, V and VI.

Community Acceptance

This evaluation criterion addresses the degree to which members of the local community support the remedial alternatives being evaluated. Three general groups from the community commented on the remedial alternatives for the site. These groups include: local citizens, the Norwalk First Taxing District (NFTD) Water Department and Potential Responsible Parties (PRPs).

Local citizens favor timely restoration of the aquifer to the maximum extent practicable.

The NFTD supports the in-situ vacuum extraction system for soil treatment (Alternative V). The NFTD has expressed concern with regard to the cost-effectiveness of groundwater extraction and treatment systems within the bedrock aquifer.

PRPs have raised numerous technical and legal concerns that tend to support Alternative I, the no-action alternative . In general, many of the PRPs feel that the groundwater extraction and treatment system currently being constructed by Elinco at the complex is a sufficient effort toward aquifer restoration.

State Acceptance

This evaluation criterion addresses the concern and degree of support that the state government has expressed regarding the remedial alternatives being evaluated.

The State of Connecticut believes that Alternative VI is an appropriate remedial action to address the Source Area, and that this remedy is consistent with Connecticut's groundwater quality standards and goals. Connecticut disagrees with EPA on technical aspects of the remedial action originally proposed for the Downgradient Area.

Technical comments presented by DEP on the Downgradient Area will be discussed and evaluated during the remedy selection process for the third operable unit. A letter of concurrence with this Record of Decision for the second operable unit (consisting of the source area) is attached as Appendix C.

Conclusion

Alternative VI, the selected remedy, provides the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Kellogg-Deering Well Field Superfund Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs and is cost effective. The selected remedy also satisfies the statutory preference for treatment which permanently and significantly reduces the mobility, toxicity or volume of hazardous substances as a principal element. Additionally, the selected remedy utilizes alternate treatment technologies or resource recovery technologies to the maximum extent practicable.

Protection of Human Health and the Environment

The remedy at this Site will permanently reduce the risks presently posed to human health and the environment by removing contaminants from soils in the unsaturated zone beneath the buildings and parking lots at the Elinco/Pitney Bowes/Matheis Court complex and by removing contaminant mass and reducing contaminant concentrations within the bedrock and overburden aquifers in the Source Area. This remedial action will:

- reduce the level of contamination in the soil at the Source Area to cleanup goals, thus preventing exposure to contamination that may present a risk to human health and the environment if any excavation occurred at the Complex;
- eliminate the leaching of soil contamination to the groundwater at levels in excess of groundwater cleanup goals;
- reduce the level of contamination in the soil at the Source Area, and thus eliminate the migration of soil vapors into the buildings at the complex and prevent human exposure to this vapor;
- reduce the contamination in the bedrock and overburden aquifers in the Source Area to cleanup levels;
- prevent the migration of contaminated groundwater from the Source Area;
- reduce the contamination in the aquifer which will decrease long-term reliance on institutional controls on future well installations to protect public health;
- minimize the future introduction of contaminated groundwater from the bedrock aquifer to the overburden aquifer supplying the Kellogg-Deering Well Field; and

- reduce the risk to the Norwalk River and the life it supports.

The Source Area groundwater will be pumped and treated until MCLS are met. At that point in time, groundwater will be sampled to determine if the cumulative carcinogenic risk falls within a risk range generally considered by EPA to be protective at Superfund sites and does not exceed unity on the Hazard Index. If the level of risk does not fall within EPA's risk range or exceeds unity on the Hazard Index, then additional treatment will be conducted in order to meet EPA's risk levels. A supplementary decision document will be issued, as appropriate.

The Selected Remedy Attains ARARs

This remedy will meet or attain all applicable or relevant and appropriate federal and state requirements that apply to the Site. Environmental laws from which ARARs for the selected remedial action for the second operable unit at the Kellogg-Deering Superfund Site include:

- Resource Conservation and Recovery Act (RCRA)
- Clean Water Act (CWA)
- Safe Drinking Water Act
- Executive Order 11988 (Floodplain Management)
- Executive Order 11990 (Protection of Wetlands)
- Clean Air Act (CAA)
- Occupational Safety and Health Administration (OSHA)
- Connecticut Water Quality Standards and Classification
- Connecticut Standards for the Quality of Public Drinking Water
- Fish and Wildlife Coordination Act
- Connecticut Public Health Code
- Connecticut Inland Wetlands and Water Courses Regulations
- Connecticut Hazardous Waste Facility Siting Rules
- Protection of Archaeological Resources

- Connecticut Air Pollution Control Regulations
- Connecticut Water Diversion Regulation
- Connecticut Discharge Permit Regulations
- Connecticut Hazardous Waste Rules
- Federal Department of Transportation Rules for Transportation of Hazardous Materials

Table 6 provides a brief synopsis of the requirements and outlines the action to be taken to attain these ARARs.

The list below includes some of policies, criteria, and guidances that will also be considered (TBCs) during the implementation of the remedial action:

- Connecticut Water Quality Management Plan
- Connecticut Draft Clean Water Strategy
- Connecticut Water Quality Standards and Classification
- EPA Risk Reference Doses (RfDs)
- EPA Carcinogen Assessment Group Potency Factors
- RCRA Proposed Air Emission Standards for Treatment Facilities (52 FR 3748, Feb. 5, 1987)
- EPA OSWER Directive 9355.0-28; Air Stripper Control Guidance
- EPA Groundwater Protection Strategy
- Connecticut Standards for the Quality of Public Drinking Water
- EPA Health Advisories and Acceptable Intake Health Assessment Documents
- Safe Drinking Water Act Maximum Contaminant Level Goals (MCLGs)
- OSHA Threshold Limit Values (TLVs)

Additional information regarding TBCs can be found in Tables 8-1, 8-2, 8-3, and 12-15 of the supplemental Feasibility Study.

The Selected Remedial Action is Cost Effective

Once EPA identifies alternatives that are protective of human health and the environment and attain ARARs (unless a waiver is invoked), EPA evaluates each of those alternatives to determine their cost effectiveness. Each of the alternatives underwent a detailed cost analysis to develop costs to the accuracy of -30 to +50 percent. In that analysis, capital and operation and maintenance costs have been estimated and then used to develop present worth costs. In the present worth analysis, annual costs were calculated for thirty years (estimated life of an alternative) using a five percent interest rate factor and were based on 1988 costs.

Of those remedial alternatives that are protective and attain ARARs, and satisfy the preference for treatment to the maximum extent practicable, EPA selected a remedy that is cost-effective in mitigating the risks posed by the soil and groundwater in the Source Area within a reasonable period of time. Overall, the total cost (present worth) of the selected remedy is estimated at $9,100,000, as presented in Table 4.

This cost is higher than that of some of the other alternatives; however, none of the less expensive technologies can ensure that the treated soil and groundwater will reach the target cleanup goals and also provide long-term effectiveness and permanence. Additionally, EPA has determined that this remedy will yield results that are in proportion to its cost in terms of effectiveness. Thus, while other alternatives evaluated are cheaper than the selected alternative, they do not provide the same degree of effectiveness.

Table 4 provides an itemized breakdown of the total cost of the remedy by elements, capital cost, operation and maintenance costs and present worth. Some changes in cost figures may be made as a result of the remedial design and construction processes.

The Selected Remedy Utilizes Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

In-situ vacuum extraction and treatment with carbon adsorption is an alternative treatment technology which provides permanent removal of the mass of volatile organic contamination in soil, thereby permanently and significantly reducing the toxicity, mobility and volume of contamination. Contaminant reduction efficiencies of 99.99% have been achieved at other sites using in-situ vacuum extraction with treatment by carbon adsorption.

The groundwater extraction/treatment portion of the selected remedy also provides permanent removal and reduction of the mass of volatile organic contaminants in groundwater through groundwater recovery and treatment via air stripping and carbon adsorption. Carbon columns will remove contaminants from the airstream before being released to the atmosphere. Treated groundwater will be discharged in compliance with discharge limitations required by ARARs.

The Selected Remedy Satisfies the Preference for Treatment as a Principal Element

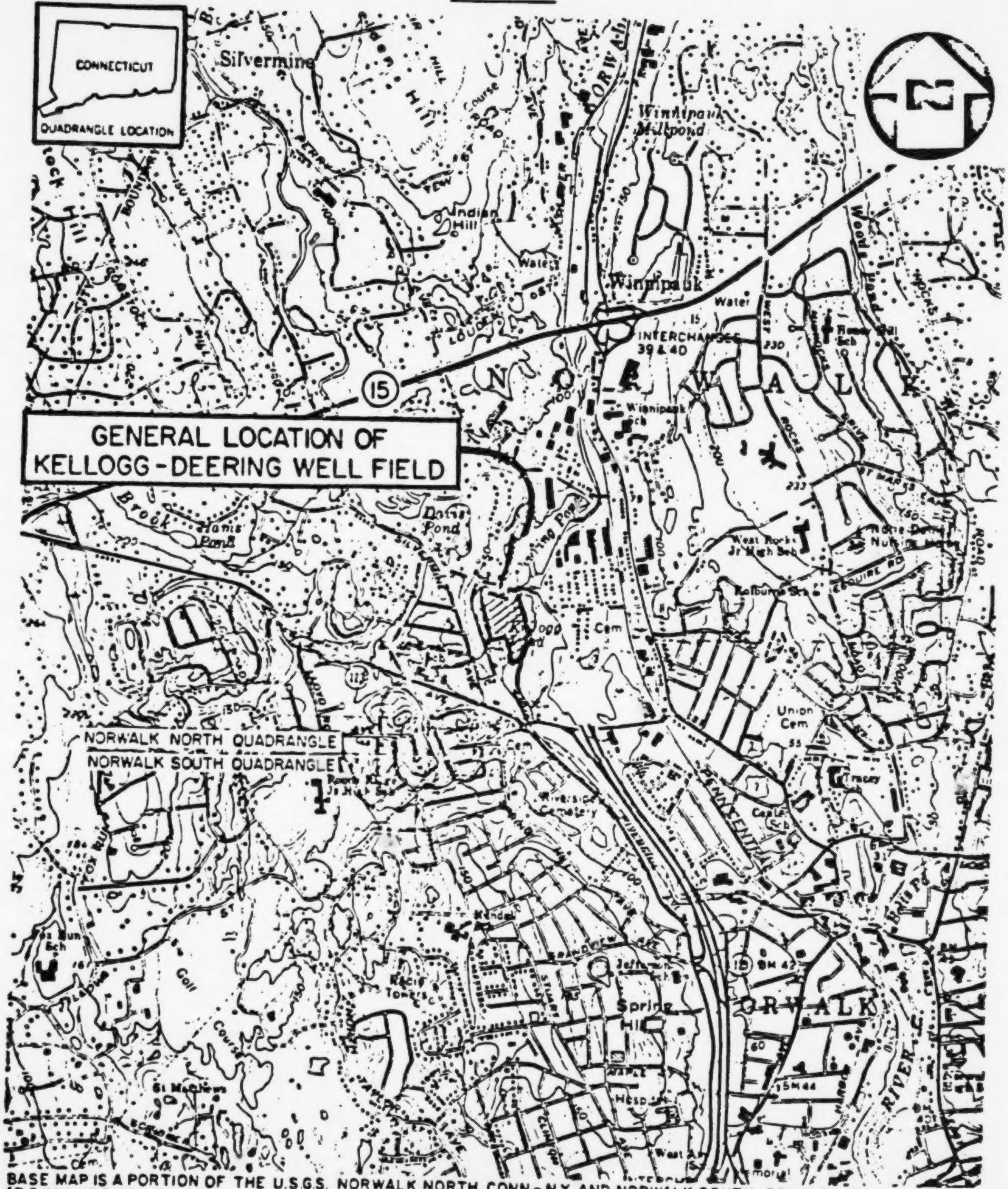
The principal element of the selected source control remedy for contaminated soil is in-situ vacuum extraction and carbon adsorption. The principal elements of the selected management of migration component for contaminated groundwater are air stripping and carbon adsorption. These elements are all technologies that use treatment to address the human health and environmental threats at the Site resulting from contamination of soil and groundwater.

STATE ROLE

The Connecticut Department of Environmental Protection has reviewed the various alternatives and has indicated its support for the selected remedy for the Source Area. The State has also reviewed the supplemental RI, Risk Assessment and FS to determine if the selected remedy for the Source Area is in compliance with the applicable or relevant and appropriate State environmental laws and regulations.

Connecticut concurs with the selected remedy for the second operable unit of the Kellogg-Deering Well Field Superfund Site, with the understanding that a third operable unit consisting of a Downgradient Area between the source and the well field will be addressed separately. Connecticut concurs that this remedy attains State ARARs.

Figure 1


CONNECTICUT
QUADRANGLE LOCATION
GENERAL LOCATION OF KELLOGG-DEERING WELL FIELD
NORWALK NORTH QUADRANGLE
NORWALK SOUTH QUADRANGLE
Silvermine
Winnipauk Millpond
Winnipauk
INTERCHANGES 39 & 40
15
Indian Hill
Union Cem
Riverside Cemetery
Spring Hill
NORWALK
Kellogg Pond
Brook
N
Golf Course

BASE MAP IS A PORTION OF THE U.S.G.S. NORWALK NORTH, CONN.-N.Y. AND NORWALK SOUTH, CONN. QUADRANGLES (7.5 MINUTE SERIES, 1960. PHOTOREVISED 1971) CONTOUR INTERVAL 10'.

SOURCE: NUS CORPORATION 1986

NOTE: SEE FIGURE 1-2 FOR DETAIL.

GENERAL LOCATION MAP

KELLOGG-DEERING WELL FIELD, NORWALK, CT

SCALE: 1" = 2000'

Reproduced from
est available copy.

FIGURE 2

Kellogg-Deering Site Location Map

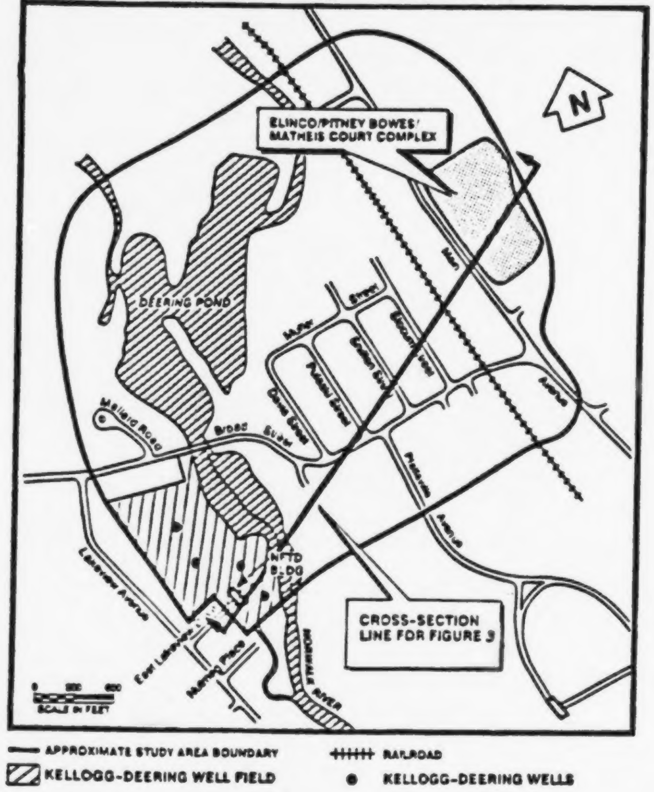

N
ELINCO/PITNEY BOWES/
MATHEIS COURT COMPLEX
DEERING POND
Broad Street
Main
Avenue
Lakeview Avenue
NFTD
BLDG
NORWALK RIVER
CROSS-SECTION
LINE FOR FIGURE 3
0
SCALE IN FEET
APPROXIMATE STUDY AREA BOUNDARY
RAILROAD
KELLOGG-DEERING WELL FIELD
KELLOGG-DEERING WELLS

FIGURE 3

General Cross-Section Diagram from Line Looking Northwest

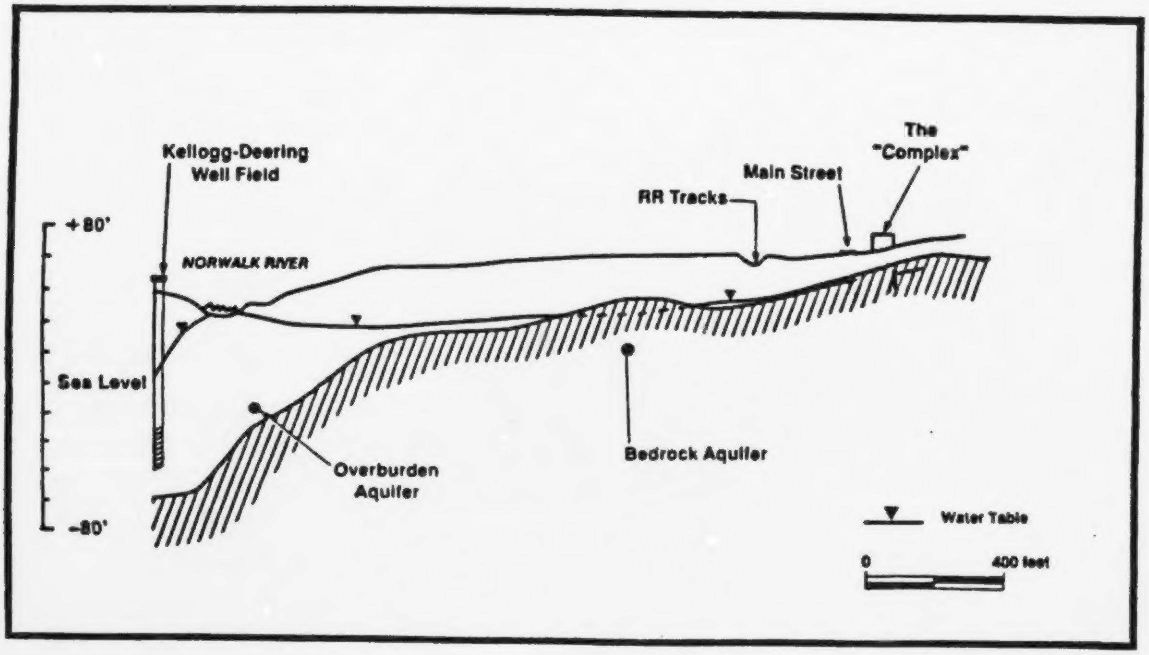

Kellogg-Deering
Well Field
The
"Complex"
Main Street
RR Tracks
+80'
NORWALK RIVER
Sea Level
-80'
Overburden
Aquifer
Bedrock Aquifer
Water Table
0
400 feet

FIGURE 4

Generalized Map of Areas of Groundwater Contamination at the Kellogg-Deering Well Field Superfund Site

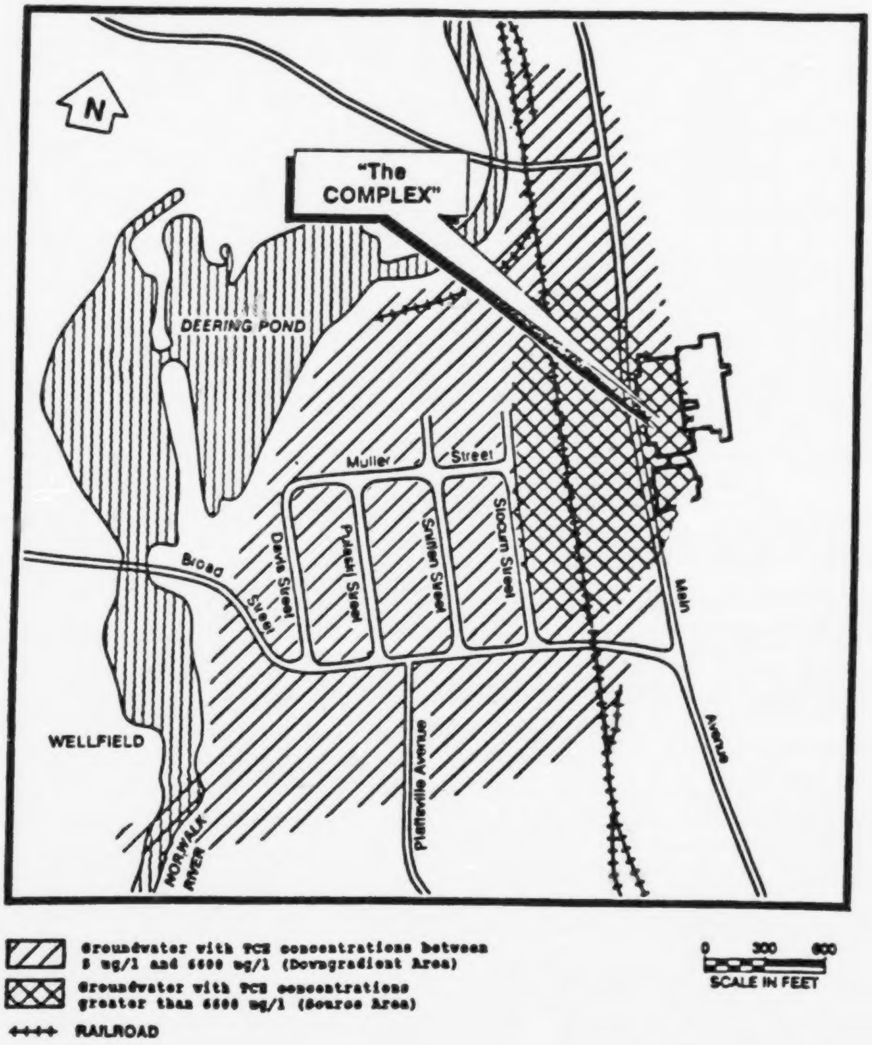

N
"The COMPLEX"
DEERING POND
Muller Street
Broad Street
Davis Street
Pulaski Street
Smith Street
Slocum Street
Main Avenue
Plattsville Avenue
WELLFIELD
NORWALK RIVER
▨ Groundwater with TCE concentrations between 5 ug/l and 6600 ug/l (Downgradient Area)
▩ Groundwater with TCE concentrations greater than 6600 ug/l (Source Area)
++++ RAILROAD
0 300 600
SCALE IN FEET

TABLE 1

INDICATOR CHEMICALS
KELLOGG-DEERING SUPERFUND SITE
NORWALK, CONNECTICUT

Indicator Chemicals	
Carcinogens	Noncarcinogens
tetrachloroethene	1,1,1-trichloroethane
trichloroethene	1,2-dichloroethene
1,1-dichloroethene	toluene
vinyl chloride	ethylbenzene
chloroform	xylenes
methylene chloride	acetone
1,1-dichloroethane	4-methyl-2-pentanone
1,2-dichloroethane	
benzene	

TABLE 2

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial Alternative	Soil	Source	Downgradient
I			
II		●	
III		●	●
IV			●
V	◆		
► VI	◆	●	
➤ VII	◆	●	●
VIII	◆		●

Blank Spaces indicate no action
- ◆ Soil treatment using in-situ vacuum extraction
- ● Groundwater extraction/treatment/discharge
- ➤ EPA's Preferred Alternative in July 1989 Proposed Plan
- ► EPA's Selected Alternative

TABLE 3

Groundwater and Soil Cleanup Goals

KELLOGG-DEERING SUPERFUND SITE
NORWALK, CONNECTICUT

Contaminant	Groundwater Cleanup Goal (μg/l)	Soil Cleanup Goal (μg/kg)
benzene	5	1.2 - 36.7
toluene	2,000	5,523 - 169,552
ethylbenzene	680	13,771 - 422,750
1,1,1-trichloroethane	200	560 - 17,332
1,2-dichloroethane	5	0.6 - 7.9
tetrachloroethene	5	33 - 1,036
trichloroethene	5	12 - 358
1,2-dichloroethene	70	76 - 2,321
1,1-dichloroethene	7	8.3 - 256
vinyl chloride	2	0.3 - 9
4-methyl-2-pentanone	350	1,246 - 38,243

TABLE 4

Estimated capital, O&M, and net present worth costs for the Selected Remedy (Alternative VI) for the second operable unit at the Kellogg-Deering Well Field Superfund Site.

Alternative VI:
- Soils - In-situ Treatment
- Groundwater - Source area treatment using air stripping

1. Capital Cost

Item	Cost
In-situ vapor extraction	$1,396,000
Air stripping system (source area)	3,508,000*
River discharge system	1,133,000
Total	$6,037,000*

2. O&M Costs

Task	Year	Cost per Event	Frequency	Present-Worth 5% for 30 years
Air Monitoring	1 2-30	$4,650 1,000	Quarterly Annually	$18,600 14,300
Groundwater Monitoring	1-30	6,600	Annually	101,200
Outfall Monitoring	1 2-30	350 350	Weekly Monthly	18,200 61,600
5-Year Site Review	1-30	20,000	Every 5 years	55,600
Energy	1-30	57,900	Annually	890,000
Maintenance	1-30	62,000	Annually	953,000
Operators (8 man-hr/day)	1-30	60,000	Annually	922,400
Total O&M Present-Worth				$3,034,900

2. Total NPW

Capital + O&M NPW	$9,100,000*

* Rounded up from $9,071,900.

TABLE 5

COMPARISON OF ESTIMATED COSTS OF ALTERNATIVES

Alternative	Capital Costs ($1,000)	Long-Term Ground Water Monitoring ($1,000)	Long-Term Air Monitoring ($1,000)	Annual O & M ($1,000)	O&M 30-year ($1,000)	Net Present Worth Cost ($1,000)
I	0	101	81	15	238	240
II	4641	101	87	200	3,058	7,700
V	1396	101	49	13	206	1,600
VI	6,037	101	33	200	3,034	9,100

TABLE 6
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) FOR THE SECOND OPERABLE UNIT AT THE KELLOGG-DEERING WELLFIELD SUPERFUND SITE

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
Federal Safe Drinking Water Act regulations establishing maximum contaminant levels (MCLs) (40 CFR 141.11-141.16)	Establish contaminant concentration levels in public drinking water. They are relevant and appropriate to the aquifer.	MCLs for indicator compounds are the target cleanup levels for groundwater at the source area. Attaining the Soil Cleanup Goals will ensure that any future migration of residual contaminants in the soil will not exceed MCLs in the source area.
Federal Resource Conservation and Recovery Act (RCRA) Groundwater Protection Standard (40 CFR Part 264, Subpart F)	Established for groundwater monitoring at RCRA-permitted treatment, storage and disposal facilities. This standard is relevant and appropriate to the aquifer.	Treatment will be conducted to achieve RCRA MCLs in groundwater. Groundwater monitoring will be conducted in compliance with 264.97, 264.98 and 264.99.
Connecticut Water Quality Standards and Classification (22a-426)	Establishes designated uses for surface water and groundwater. This is applicable to aquifer restoration and to any discharges to the Norwalk River and the aquifer.	MCLs and public health code levels will be attained to restore the aquifer to its designated use as a drinking water aquifer and surface water discharges will meet NPDES limitations.

Table 6 - page 2

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
Standards for Quality of Public Drinking Water; Connecticut Public Health Code	Establishes water quality standards for water supplies. (CT Public Health Code Regulation 19-13-B102) This requirement is relevant and appropriate to the aquifer.	Cleanup of the aquifer will be conducted in accordance with these standards.
Federal Clean Water Act (CWA) 404 (33 U.S.C. 1344, 40 CFR 230)	This requirement is applicable to any dredging or filling activities in the wetlands or the river.	If any dredging or filling action is required in the wetlands then Section 404 will be compiled with. The governing regulations favor practicable alternatives that have less impact on wetlands. If no mitigated practicable alternative exists, impacts must be mitigated.
Federal Fish and Wildlife Coordination Act, 16 U.S.C. 661	This requirement is applicable to any action which modifies the Norwalk River.	If it is determined that the remedial action potentially modifies the Norwalk River, actions will be coordinated with the U.S. Fish and Wildlife Service.
RCRA Location Standards (40 CFR 264.18)	This requirement is applicable if a RCRA facility is located in the 100 year floodplain.	It is assumed that remediation facilities will be located outside floodplains. Temporary staging areas or remediation facilities that are located by a floodplain will be designed to allow quick mobilization out of the area and to prevent damage caused by initial floodwaters.

Table 6 - page 3

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
Wetlands Executive Order (E.O. 11990)	Under this Executive Order, federal agencies are required to minimize the destruction, loss or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. If no practicable alternative exists, impacts must be mitigated. This is applicable to any activity in the wetland.	EPA will choose a discharge method for treated groundwater that avoids impacts to the wetlands. If no practicable alternative exists, impacts to the wetlands will be mitigated.
Floodplains Executive Order (E.O. 11988)	Federal agencies are required to reduce the risk of flood loss, to minimize impact of floods, and to restore and preserve the natural and beneficial value of floodplains. This is applicable to any activity in the floodplain.	EPA will choose a discharge method for treated groundwater that avoids impacts to the floodplain. If no practicable alternative exists, impacts to the floodplain will be mitigated.
Connecticut Inland Wetlands and Water Courses Regulations (Title 22a)	These requirements are applicable for alternatives that affect wetlands. These requirements limit activities that deposit material in, alter, or pollute inland wetlands and water courses.	These requirements will be met for any activity in the wetland at the site.

Table 6 - page 4

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
Connecticut Hazardous Waste Facility Siting Rules (Title 22a)	This requirement is applicable where more stringent than Federal Regulations.	These requirements will be met when siting the treatment facility.
Federal Clean Water Act (40 CFR 122-125) National Pollutant Discharge and Elimination System (NPDES)	These requirements regulate discharges to surface water are applicable to treated groundwater at the site.	Water discharges from the treatment systems will be in compliance with the Clean Water Act.
Occupational Safety and Health Act (OSHA) - General Industry Standards (29 CFR 1910)	This applicable regulation specifies the 8-hour, time-weighted average concentration for various organic compounds and 2 PCB compounds; site control procedures; training and protective clothing requirements for worker protection at site remediations.	Proper respiratory equipment will be worn if it is not possible to maintain the work atmosphere below these concentrations.
Occupational Safety and Health Act (OSHA) - Safety and Health Standards (29 CFR 1926)	This applicable regulation specifies the type of safety equipment and procedures to be followed during construction and excavation activities.	All appropriate safety equipment will be on site procedures will be followed during groundwater monitoring.
Occupational Safety and Health Act (OSHA) - Recordkeeping, Reporting and Related Regulations (29 CFR 1904)	This applicable regulation outlines the recordkeeping and reporting requirements for an employer under OSHA.	These regulations are applicable to the company contracted to execute site remediation.

Table 6 - page 5

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
Clean Air Act (CAA) - National Air Quality Standards for Total Suspended Particulates (40 CFR 129.105, 750)	This applicable regulation specifies maximum primary and secondary 24-hour concentrations for particulate matter.	Fugitive dust emissions from site activities will be maintained below 150 ug/m3 (secondary standard) by water sprays and other dust suppressants.
Protection of Archaeological Resources (32 CFR 229)	These regulations develop procedures for the protection of archaeological resources.	If archaeological resources are encountered during excavation, these regulations will be applicable and the area must be reviewed by federal and state archaeologists.
Connecticut Air Pollution Control Regulations (22a - 17a)	These regulations are applicable during treatment operations.	Air emission limits from the the treatment systems will be in compliance with the Connecticut Air Quality Standards.
Connecticut Water Diversion Regulation (22a-365)	Diversion of water of the state will be allowed only when such diversion is found to be necessary and is compatible with the state's long-range water resource planning and management. These regulations are applicable.	The groundwater extraction system will be operated as to minimize impacts on the well field and Norwalk River flow rate. Partial shut down of extraction wells may be required during extremely dry precipitation events.

Table 6 - page 6

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
Connecticut Discharge Permit Regulations	These applicable requirements supplement the CWA NPDES permit requirements.	Groundwater treated onsite and discharged to a surface water will need to comply with the water quality standards and complete routine monitoring and recordkeeping activities.
Connecticut Hazardous Waste Rules (22a-449) (Title 22a-430)	This regulation outlines requirements for the construction, operation, and location of a hazardous waste facility. These regulations, where more stringent than federal requirements, are applicable to the site.	These requirements will be complied in constructing and operating the treatment systems.
FEDERAL DOT - Rules for the Transportation of Hazardous Materials (49 CFR 107, 171.1 - 171.500)	Specific requirements for markings, vehicle registration, manifests, and transportation of hazardous wastes and chemical substances are applicable.	All on- and off-site transport of excavated soil treatment sludges, and other materials will follow these standards.
CWA Pretreatment Regulations (40 CFR 403)	This applicable regulation specifies pretreatment standards for discharges to publicly-owned treatment works (POTWs).	If treatment system discharge is sent to a POTW, the POTW must have an approved pretreatment program and the discharge must comply with the POTW program.

Table 6 - page 7

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
RCRA Facility Standards and Land Disposal Restrictions (40 CFR 264)	This regulation is applicable to land disposal of certain RCRA wastes and of materials contaminated with or derived from RCRA wastes.	These requirements will be complied with in disposing of material on-site and off-site.
RCRA General Facility Requirements (40 CFR 264.10-264.18)	General facility requirements outline general waste security measures, inspections, and training requirements. These regulations are applicable.	Substantive requirements will be applicable to PTD and vapor extraction facility. Periodic analysis of the influent groundwater and treatment residues will be conducted in accordance with 264.13. Locked facilities, fencing and the presence of operators should be in accordance with 264.15. The facility will undergo regular inspections by the operators in accordance with 264.15. The operators will be trained in accordance with 264.16. Any of the PTD systems effluent piping near the river will be designed in accordance with 264.18.
RCRA - Preparedness and Prevention (40 CFR 264.30- (40 CFR 264. 30-37)	This regulation outlines requirements for safety equipment and spill control. These requirements are applicable.	Substantive requirements will be applicable to PTD and vapor extraction facility. The treatment facilities will be designed and operated in accordance with 264.31.

Table 6 - page 8

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
		Support equipment in compliance with 264.32 will be provided for the facilities. This equipment will be tested and maintained in accordance with 264.33. State and local authorities will be educated as to the hazards at the facilities in accordance with 264.37.
RCRA Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56)2	This regulation outlines the requirements for emergency procedures to be used following explosions, fires, etc. These requirements are applicable.	Substantive requirements will be applicable to PTD and vapor extraction facility. Contingency plans will be developed in accordance with 264.50 to 264.55.
RCRA Manifesting, Recordkeeping, and Reporting (40 CFR 264.70 - 264.77)2	This regulation specifies the recordkeeping and reporting requirements for RCRA facilities. These requirements are applicable.	Substantive requirements will be applicable to PTD and vapor extraction facility. Recordkeeping utilized at the facilities will be in accordance with 264.73 and 264.74.
RCRA Container Requirements (40 CFR 264, Subpart I)	This regulations sets forth RCRA requirements for use and management of containers at RCRA facilities. These requirements are applicable.	Packing and accumulation of treatment sludges and other materials will adhere to these standards.

Table 6 - page 9

ARARS	REQUIREMENT SYNOPSIS	ACTION TO BE TAKEN TO ATTAIN ARARS
RCRA - Closure and Post-Closure (40 CFR 264.111)	These requirements are relevant and appropriate to soil cleanup and groundwater.	The facilities will be closed in accordance with the closure performance standard 264.111.
RCRA - Tanks (40 CFR 264.190-264.199)	This requirement may be applicable to tanks of treatment systems.	This requirement will be complied with to the extent that it is an ARAR which depends on discharge option implemented.
Connecticut Public Health Code (19a-36)	Provides controls to restrict groundwater use as potable water. This requirement is applicable to the site.	This requirement will be complied with to restrict private well use at the site.

RECORD OF DECISION
KELLOGG-DEERING SITE - OPERABLE UNIT 2
SOURCE CONTROL

APPENDIX A

RESPONSIVENESS SUMMARY

KELLOGG-DEERING
RESPONSIVENESS SUMMARY

I. INTRODUCTION

This responsiveness summary addresses the comments received by EPA on the Supplemental Feasibility Study and Proposed Plan for the Kellogg-Deering Well Field Superfund site in Norwalk, Connecticut. The comments were received from citizens, the State of Connecticut and also from a number of potentially responsible parties (PRPs) during the 30-day comment period held from July 27, 1989, to August 25, 1989.

Written comments were received from ten parties and two people presented oral comments at the public hearing held in Norwalk on August 14, 1989. The transcript of the public hearing is provided as Exhibit B to this Responsiveness Summary. The comments are summarized and organized by subject. EPA responses to each comment, or set of like comments, are provided.

As a result of the decision made in this Record of Decision (ROD) to create a third operable unit to address the Downgradient Area, EPA did not address the comments that were received pertaining to the Downgradient Area at this time. At the time a final decision is made on the remediation, the Downgradient Area comments that have been received will be more thoroughly responded to.

II. BACKGROUND ON COMMUNITY RELATIONS ACTIVITIES

Community concern and involvement at the Kellogg-Deering Well Field Superfund site has fluctuated since the Well Field was first discovered to be contaminated in 1975. Initial concern in the community was very high, as residents feared they had been using unsafe drinking water.

Public interest escalated in 1983 when the site was proposed to the National Priorities List of Superfund sites that are eligible for federal funding for investigations and cleanups. A local group of citizens, known as the Waterforce, became active in monitoring EPA cleanup plans. In 1984, EPA prepared a community relations plan to assess community concerns and develop activities to respond to informational and public involvement needs related to those concerns. Most community concerns related to possible adverse health effects, the adequacy of the water supply, the need for more public information on the site, and concern about the length of time necessary for studies before cleanup action could be taken. A public meeting was held in July of 1984 to answer questions from about 60 people who attended the meeting.

The community relations plan was updated in June of 1986. Although citizen concern was not as intense as it had been when contamination was first discovered at the Well Field, citizens interviewed said that having a safe drinking water supply was still their principal concern. Other issues noted by residents included concern about the following:

- future constraints on growth caused by water supply problems;
- possible dangerous emissions from the air stripper installed to treat the water supply wells;
- potential spread of contamination as a result of the construction of Route 7 where it passes near the well-field;
- protection of wetlands on the site;
- monitoring of the quality of the water supply by the Norwalk First Taxing District; and
- the amount of time spent studying the site.

The community has not been visibly active in raising concerns about the site since initial questions were responded to in 1984 and the Norwalk First Taxing District began its own well-head treatment program in 1986 to control the pollution of the water supply wells. The community has, however, expressed an interest in being informed of activities at the site and the schedule for decisions to be made to advance site cleanup.

To keep the public informed and involved in decision points in the Superfund process, EPA has held numerous public meetings and issued written material and press releases to the Norwalk community. A complete chronology of community relations activities conducted by EPA is attached as Exhibit A of this Responsiveness Summary document. After EPA mailed a fact sheet and held public meetings to explain the first of two remedial investigations and EPA's options for a well-head treatment system, EPA invited public comment. During the public comment period conducted in 1986, EPA received one citizen comment and several comments from potentially responsible parties at a public hearing and in writing. A Record of Decision to improve the existing well-head treatment system was approved in September 1986 as the first step in the cleanup of the Kellogg-Deering site.

There has been little or no community action relative to EPA activities since the 1986 Record of Decision was signed. In January 1988 EPA released a fact sheet on the results of a study to determine the sources of groundwater contamination. In July 1989 EPA mailed a proposal, the Proposed Plan, to address the sources of contamination to interested and affected individuals. The release of the Proposed Plan was followed by a public informational meeting and a public hearing on the proposal. Approximately 30 people attended the meeting and the hearing.

The comments received from citizens, local officials, the state of Connecticut, and potentially responsible parties are summarized and responded to in the following sections of this document. A transcript of comments made at the public hearing held August 14, 1989, is attached as Exhibit B of this Responsiveness Summary.

III. SUMMARY OF COMMENTS AND EPA RESPONSES

A. SUMMARY OF COMMENTS FROM PRPs

Provided below are comments from parties that EPA considers to be potentially responsible parties (PRPs) for the site, and EPA's responses to those comments. The comments were provided by three PRPs: Electric Indicator Company, Inc. (Elinco), EDO Corporation and Pitney Bowes.

Beveridge & Diamond and Versar commented on behalf of Elinco; Sidley & Austin and Goldberg, Zoino & Associates (GZA) commented on behalf of EDO Corporation; and Murtha, Cullina, Richter and Pinney, and Dames & Moore commented on behalf of Pitney Bowes.

All PRP commentors asked for an extension to the public comment period, however none was granted by EPA.

Complex as a Source of Contamination

1. **Comment:** The remedial investigation and feasibility study (RI/FS) fails to demonstrate that the Elinco/Pitney Bowes/Mathies Complex (the Complex) is a major source of Well Field and aquifer contamination, basing its conclusion on general qualitative, not quantitative, analysis. The bedrock between the Complex and the Well Field has been treated as a "black box" accounting for TCE migration, without showing actual transport mechanisms.

   The RI/FS found fractured bedrock to be the major migration pathway from the Complex to the northwest, west, and southwest, while explicitly acknowledging that bedrock fractures at Kellogg-Deering are tight and widely spaced, and that contaminant flow is therefore difficult to trace. Further, the RI/FS has failed to identify major bedrock fractures that can be shown to be carrying contaminants outward from the Complex, and instead relies on regional fracture orientation for this purpose. It is technically just as plausible that the contaminants in the fracture came from other sources located in different directions and at different distances from that fracture zone.

EPA Response: Groundwater data obtained by EPA indicates that the Complex is a significant source of contamination. Sampling and analysis demonstrated that a plume of contamination is emanating away from the Complex in a semi-radial pattern from the northwest to southwest. Moreover, this testing indicates that contaminant movement occurs initially in the bedrock and then in both the overburden and bedrock aquifers. The southwest extent of the plume is migrating below the Norwalk River and intersects the Kellogg-Deering Well Field. The west and northwest edge of the plume extends to the Deering Pond and the Norwalk River.

Both of EPA's field investigations, documented in the initial and supplemental remedial investigation reports, show that groundwater contaminants are moving through the unconsolidated overburden aquifer at the Complex and through deep and shallow fractures of the bedrock aquifer to the sand and gravel aquifer that supplies the wells of the Kellogg-Deering Well Field. Some of the contamination has entered bedrock fractures immediately below the buildings at the Complex. Contaminants discharge from the bedrock into the overburden aquifer in the vicinity of the Norwalk River and the CL&P Landfill. While the actual location of every fracture containing contaminated groundwater is uncertain and other sources of contamination may be present, EPA believes that a "piping system" of bedrock fractures from the Complex allows contamination to migrate toward the Kellogg-Deering water supply wells and the data clearly indicates that the Complex is a major source of contamination.

2. **Comment:** Pitney Bowes indicated that they do not store, use, or dispose of significant quantities of TCE in the Zell Building Complex, and did not have TCE on-site until 1983-84. Their entire inventory of TCE since occupying the building has totaled 55 gallons; one gallon purchased in 1983, and 55 gallons purchased in 1984.

   EPA Response: These comments relate to enforcement issues that are not the subject of this ROD. In this Responsiveness Summary, EPA must address significant comments relateing to the selected remedy. Comments on enforcement issues need not be responded to in this Responsiveness Summary and con be dealt with during negotioations.

3. **Comment:** Pitney Bowes provided a number of comments indicating that Elinco is the source of the TCE contamination found at the Complex.

   EPA Response: These comments, like the previous one, relate to enforcement issues that are not the subject of this ROD.

Comments on enforcement issues are not the subject of this Responsiveness Summary.

Groundwater Contamination

4. **Comment:** The RI/FS does not actually identify a pathway to the wells west of the Norwalk River, but merely hypothesizes one by assuming unidentified localized open fractures. Until a link is proven, PRPs cannot be liable for Well Field contamination, given several precedents.

   EPA Response: Determining if a given party is liable for the contamination of the Kellogg-Deering Well Field is not the subject of this Record of Decision, which focuses on the selection of a remedy for the site. However, as indicated in EPA's response to Comment #1 above, sampling and analysis show that contaminants move through both the overburden and bedrock aquifers from the Complex toward the Well Field.

5. **Comment:** The RI/FS incorrectly uses the greatest value for hydraulic conductivity from tests. The number used is both incorrectly calculated and is not representative of hydraulic conductivity throughout the study area bedrock. Similarly, the RI/FS used stratified drift hydraulic conductivity measurements from the Well Field and applied those throughout the study area, although hydraulic conductivity for stratified drift varies considerably throughout the study area. Both approaches are technically inappropriate.

   An alternative model of hydraulic conductivity shows that any contaminant release from the Complex on the dates alleged in the RI/FS would not yet have arrived at the Well Field or at other areas of high contaminant concentration in the aquifer beyond the immediate vicinity of the Complex. This model is supported by EPA's tracer studies, which could detect no tracer salts downgradient from the Complex in the short term, and in only one instance in the long term. The one positive sample suffered from three technical difficulties that make it an improper basis for establishing a migration pathway.

   EPA Response: EPA recognizes that hydraulic conductivity may vary with the different lithology in the aquifer; however, the values EPA used and how they were applied were not inappropriate. EPA utilized the average transmissivity and hydraulic conductivity values for the stratified drift deposits and the geometric mean for the conductivity in the bedrock aquifer. For bedrock flow, a high value was used to illustrate the potential transport capabilities of the rock mass.

The model EPA utilized is appropriate for this situation. Although an alternative model that uses a lower hydraulic conductivity value may show that contamination from the Complex could not have reached the Well Field, this is not supported by extensive sampling and analysis that shows that contaminants (primarily TCE), are move through both the overburden and bedrock aquifers toward the Well Field. Moreover, the alternative model presented ignores highly permeable bedrock fractures that could serve as a major route for contaminant flow to the Well Field.

The alternative model, presented by the PRPs, which predicts maximum travel distances of 125 meters for contaminants discharged at the site for over 40 years, relies on assumptions and input values that EPA believes are not valid. The model describes the glacial deposits in the area adjacent to and down-gradient of the source area as till that have very low hydraulic conductivities, when in fact they are stratified glacial drift deposits with much higher hydraulic conductivities than tills. Also, the hydraulic conductivity value used (0.35 ft/day) was incorrectly calculated from an aquifer test (the "K-19A slug test"). The correct value, 144 ft/day, results in contaminant flow rates that are about 250 times greater than predicted by the alternative model.

Although it may be difficult to draw definite conclusions from the tracer study conducted by EPA, the alternative model presented is not necessarily supported by the study.

EPA believes the tracer study illustrated the complexity of groundwater flow at the site, but did not demonstrate definitively whether or not the Complex is a source of the contamination found at the Well Field. Additionally, EPA did not rely on a single reading from the tracer study to conclude that there is a hydrogeologic link between the contamination found at the Complex and at the Well Field. The tracer study was only one part of a very extensive investigation conducted by EPA to define the nature and extent of contamination found at the site. In addition to the tracer work, the lithology of the aquifer was studied, and extensive sampling and analysis was conducted that showed that contaminants move through both the overburden and bedrock aquifers toward the Well Field. In fact, the distribution of TCE in the groundwater was the "tracer" that EPA used to conclude that the Complex is a source of contamination for the Well Field.

6. **Comment:** The RI/FS concludes that the migration pathway is demonstrated by a general increase in TCE concentrations in five bedrock wells as one moves from the Well Field toward the Complex. However, the conclusion rests on an inadequate

data base, and in fact suggests that the contaminant flow is both more complex than suggested in the RI/FS, and may point to other contamination sources.

EPA Response: EPA concurs with the comment that groundwater flow and contaminant transport at the site are very complex due to the interaction of the overburden and fractured bedrock aquifers and does not dispute that there may be other sources that contribute to contamination in the aquifer and at the Well Field. However, the data base that EPA utilized to determine that the Complex is a significant source of contamination and that this is affecting the Well Field water quality is adequate. Analytical data collected from monitoring wells in and around the Complex show the highest concentrations of contamination. This data, as well as groundwater level measurements throughout the area, clearly show that the Complex is a major source of contamination and that that contamination is flowing from the Complex toward the Well Field.

7. **Comment:** The areal extent of the source area groundwater remediation is too large. The source area is defined as that area with TCE concentrations greater than 6,600 ppb because that is the maximum level EPA deemed the Well Field air stripper could safely treat. However, the air stripper can easily be modified to treat higher concentrations, making possible the use of TCE concentrations above 6,600 ppb as a source area boundary. If EPA's definition of the source area is based on health risks to Well Field users, the only receptors, given admittedly effective institutional controls, those risks are better and more cost-effectively addressed by modifications to the air stripper at the Well Field than by groundwater treatment at the source area. This is true because 1) air stripping at Well Fields is a tried, effective, and readily implementable remedial action, 2) the Well Field air stripper can be modified easily and at low cost, and 3) the effectiveness of air stripping at the source area as proposed in the RI/FS is highly uncertain at best given the recognized difficulty of treating groundwater in bedrock fractures.

Even if the 6,600 ppb delineation is judged appropriate, the area designated in RI/FS is too large, as it includes many monitoring wells that do not show TCE concentrations above 6,600 ppb. In particular, although EPA's mobile lab found a TCE concentration of 37,840 ppb in a sample from the K-8 monitoring well 250 feet southwest of the Complex, a second sample taken at the same time and analyzed using more accurate contract laboratory procedures measured only 4,700 ppb. Thus, it is inappropriate to extend groundwater treatment beyond the immediate vicinity of the complex.

EPA Response: The Source Area groundwater extraction and treatment system will be developed to attain ARARs (e.g., MCLs) in the aquifer. The area is defined by the 6,600 ug/l TCE contour line as shown in the supplemental RI/FS. The areal extent of this system will be refined as part of the pre-design activities to maximize contaminant removal rates and to pinpoint the location and number of extraction wells. In any event, there will be two sets of extraction well networks to be installed: one within the Complex boundaries and one near the railroad tracks to the west of the Complex.

8. **Comment:** EPA states without explanation that 80 percent of the soluble contaminants originating at the Complex have already migrated beyond the property line. That statement is without apparent basis, in light of the much higher levels of TCE measured in monitoring wells at the Complex as compared to those in the downgradient portion of the source area.

EPA Response: Although the highest concentrations of TCE and PCE are found at the Complex, most of the contamination is found outside of the its boundaries at lower concentrations, but still exceeding MCLs, in the huge volume of groundwater in the surrounding aquifer. Because a significant portion of the contamination has moved from the complex, the pumping and treatment of the aquifer is necessary to achieve the cleanup goals.

9. **Comment:** Based on a computer model of contaminant transport, the cleanup goal for the source area bedrock aquifer should be 160 ppb. As a result of dispersion and assuming no retardation, a TCE concentration of approximately 160 ppb at the Complex would be reduced to 25 ppb at the Norwalk River. Then, assuming 80% dilution of the groundwater by clean water from the Norwalk River (reasonable and similar to the dilution factor used by NUS), the contaminant concentration would be lowered to 5 ppb, the MCL for TCE.

EPA Response: The cleanup is based on achieving MCLs and state ARARs throughout the aquifer and not only at the Well Field. With MCLs and state ARARs as the goal, the effect of dilution on the contaminant concentrations is not relevant to the aquifer cleanup levels. In addition, RCRA regulations on closure require that the soils be decontaminated so as not to result in unacceptable groundwater contamination.

10. **Comment:** Their appears to be some inconsistencies in the calculated dilution of water at the Well Field by the Norwalk River and in the assumptions that EPA presented in

the RI/FS about this. EPA has not used the lowest assumptions in deriving its future (plausible case) scenario. Neither future scenario depicts the true risks posed by the site and thus basing the need for further remedial action on either future scenario is unwarranted.

EPA Response: Dilution of the Well Field by the river is dependant on seasonal changes and the amount of pumping and types of wells being used. Although dilution of contaminated groundwater due to recharge from the river will reduce contaminant levels, if the treatment system at the Kellogg-Deering Well Field were not in use through mechanical failure or otherwise, the contaminants in the aquifer could pose a risk to human health. In addition, the cleanup must attain legally applicable or relevant and appropriate requirements set by state and federal laws, including MCLs set under the federal Safe Drinking Water Act.

11. **Comment:** In Section 12 of the RI/FS, EPA makes assumptions about how each remedy will reduce the toxicity, mobility, or volume of TCE. These assumptions, however, are not supported by earlier statements in the RI/FS about the nature and extent of contamination.

For example, on p. 176, the RI/FS states: "of the total quantity of contaminated groundwater, 15% is in the bedrock and 85% is in the overburden." This statement contradicts the statement on page 147: "although contamination has been detected in both overburden and bedrock monitoring wells, it is apparent from the distribution of contamination that migration in the bedrock groundwater regime is the primary contaminant migration pathway."

With such internally contradictory remarks, there is no way to adequately determine if EPA's preferred alternative is justified. The effectiveness of each remedial alternative will obviously be affected by the assumptions made concerning the nature and extent of contamination. Since EPA's preferred alternative relies on assumptions contradicted elsewhere in the RI/FS, there is no rational basis for the alternative.

EPA Response: There is no contradiction in the remarks that are quoted, in fact the two statements deal with different topics. One addresses the distribution of contamination, a majority of which is found in the overburden, and the other deals with contaminant transport, which occurs primarily in the bedrock.

EPA's cleanup plan for the site is justified and is based on a careful evaluation as outlined in the ROD. That evaluation includes a complete analysis of how the cleanup satisfies the statutory and regulatory criteria for selecting remedial actions under CERCLA.

12. **Comment:** The preferred alternative assumes that no dense non-aqueous phase liquid (DNAPL or "free product") TCE exists in the groundwater beneath the Complex, but the RI/FS concludes that some DNAPL TCE must exist there. Because it may continue to release aqueous TCE, the presence of DNAPL TCE may prevent the preferred alternative from accomplishing its objective, possibly to the point where TCE levels do not decrease. Thus, a remediation plan such as the preferred alternative that does not address specific removal of "free product" from the bedrock aquifer will be no better than continuing the current treatment of groundwater by NFTD.

EPA Response: The remedy includes pre-design work to refine the understanding of the nature and extent of contamination. If free product, or DNAPL, is found, the design of the groundwater treatment system will take this into account. Additionally, even if free product is found, the cleanup goals for the remedy will not change.

13. **Comment:** The RI/FS notes that because of complex hydrogeology and potential presence of DNAPL TCE, no estimates can be made for the natural flushing of the source area, which directly contradicts the logic of the preferred alternative.

EPA Response: Recognizing the real limitations of the understanding of the hydrogeology and distribution of contaminants does not contradict the logic of the cleanup plan. The remedy is an aggressive plan to cleanup a contaminated aquifer. Its design will take into account the complexity and uncertainties of the situation, including contaminant distribution and the site's hydrogeology. As stated in the ROD, the estimated time for remediation may exceed 10 years.

14. **Comment:** Given the area's complex hydrogeology, it is not known, and is not reasonable to assume, that the 250 ft. deep pumping wells will be in contact with the same bedrock aquifer now being monitored. Further, without knowing where the DNAPL TCE exists, the deep wells could introduce TCE to greater depths and/or other aquifers. Even if the deep wells were to contact the aquifer now being monitored, it is not known whether they will be able to extract DNAPL TCE. In short, pumping and treating the bedrock aquifer will not be effective using existing geologic information.

EPA Response: As responded to earlier, the remedy includes pre-design work to refine the understanding of the hydrogeology and the nature and extent of contamination. If free product, or DNAPL, is found, the design of the groundwater treatment system will take this into account. Additionally, wells will be installed in a manner to ensure that contamination is not introduced from the overburden into bedrock.

Other Potential Sources of Contamination

15. **Comment:** EPA has failed to investigate adequately other potential source areas of Well Field and aquifer contamination. EPA investigated only two other potential contaminant sources in the study area, although provided with extensive information regarding both other industries that have used large amounts of solvents, and solvent spills and discharges, and provided with specific suggestions for alternate source investigations. The Agency should thoroughly evaluate those potential sources of contamination or, provide an explanation of its decision not to.

EPA data supports the possibility that other sources may be responsible for contamination. For example, the lack of TCE in bedrock monitoring well K-22B coupled with the elevated TCE concentrations in well K-21, located downgradient of well K-22b, suggests a contamination source other than the Complex.

EPA Response: EPA does not dispute that there may be other sources that contribute to contamination of the aquifer and the Well Field; however, the Complex is a significant source of contamination that requires remediation. Sampling and analysis shows that a plume is emanating away from the Complex in a semi-radial pattern from the northwest to southwest. Moreover, this testing indicates that contaminants move in both the overburden and bedrock aquifers to the Well Field. Extensive sampling of over 120 wells and borings at the site , as well as work done by the Connecticut Department of Environmental Protection have failed to identify other sources of contamination.

Two other potential sources of contamination (Wesco and a Shell gas station) were evaluated by EPA in the supplemental RI because they are identified in the 1986 RI as potential sources of contamination. They were, however, found not to be TCE or PCE contaminant sources after further analysis.

EPA may consider whether to evaluate other potential sources of contamination.

The lack of TCE at well K-22B does not necessarily indicate that a source other than the Complex is responsible for contamination in down-gradient locations. Because of the fracture orientation in the bedrock, some wells in up-gradient locations may be free of contamination while other nearby wells could be highly contaminated.

Risk Assessment

16. **Comment:** EPA's risk calculation for workers at the Complex is overly conservative because 1) it does not take into account worker movement, but rather assumes that workers stay directly above contaminated areas all day; 2) it assumes a 40-year working period, 3) it overestimates inhalation rates, and 4) it does not address likely changes in contaminant concentration with the seasons. Further, the risk assessment does not consider the possibility that measurements were influenced by contaminated surfaces near former operational areas, rather than soil gas; nor does it take into account the possible use of TCE in certain of the buildings during sampling of building air.

    EPA Response: EPA's risk calculation is meant to be conservative to ensure protection of human health. It assumes that workers could be exposed to contamination eight hours per day over forty years.

    Although other sources of contamination could contribute to the air pollution problem found, given the concentration of TCE and PCE found in the Complex area, contaminant transport from the soil to the building air is significant.

17. **Comment:** Soil remediation is not necessary under the three buildings at the Complex, as they already meet Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) for PCE and TCE. PELs are the correct enforceable standard, not EPA's target excess cancer risk range, which should be used only when a standard such as OSHA's does not exist.

    EPA Response: Soil remediation is necessary for three reasons: First, contamination in soil contributes to groundwater contamination that exceeds Maximum Contaminant Levels (MCLs), EPA's cleanup goal for groundwater. Second, although the levels of contaminants measured were within the standards set for industrial safety by the Federal Occupational Safety and Health Administration, the risks from exposure to these levels ($4x10^{-4}$) exceeds EPA's Superfund target risk range of 10^{-4} to 10^{-7}, using a reasonable worst-case scenario. Third, the Resource, Conservation and Recovery Act (RCRA) closure regulations, which are relevant and appropriate to the site, require that soil be cleaned so that contaminated leachate is not generated that could result in unacceptable groundwater quality.

18. **Comment:** Should remediation to meet EPA standards be necessary, sealing the Complex building's floors and related measures would be a more reliable and cost effective remediation method.

    EPA Response: EPA does not dispute that sealing floors and other similar actions could address the inhalation risks posed in the buildings; however, this would not address the contribution that the contaminated soil has to pollution in groundwater and this would not attain RCRA closure requirements, an ARAR at the site.

19. **Comment:** Concerns about future human contact with contaminated soil through building demolition and soil disturbance can be met with institutional controls, such as have been successfully used elsewhere, and by means of an analysis of the need for soil remediation measures at the time a change in use of the Complex property dictates that such an analysis is needed.

    EPA Response: CERCLA requires EPA to select permanent remedies that employ treatment to reduce the mobility, toxicity or volume of the contamination (if such a remedy is practicable), over remedies that rely on non-treatment based mechanisms such as institutional controls and containment. Additionally, EPA must assure that the remedy provides long-term protectiveness. If soils are not remediated, the groundwater cleanup goal of achieving MCLs would not be met and, also, given the potential failure of institutional controls, institutional controls alone would not provide for adequate protectiveness.

20. **Comment:** The risk assessment used to determine goals for soil remediation alternatives is seriously flawed. The baseline risk assessment concentrates on the risk that contaminants in the soil serve as a continuing source for contamination of groundwater. The risk assessment therefore estimates that amount of TCE and PCE that may remain in the soils without resulting in TCE and PCE groundwater contamination above 5 ppb. The assessment assumes that all buildings and asphalt are removed from the property.

    First, the use of MCLs for TCE to determine groundwater cleanup levels is inappropriate, since the MCL is not itself an ARAR for groundwater at Kellogg-Deering, as detailed elsewhere. Similarly, the 5 ppb groundwater cleanup level set for PCE is inappropriate for setting soil cleanup levels, as the PCE groundwater goal set by EPA is not an ARAR, nor does it appear to be based on any meaningful assessment of PCE's threat to human health or the environment.

Second, the assumption that soil contamination should not be permitted to contaminate groundwater at levels above 5 ppb of TCE and PCE is unreasonable in light of two other Agency findings. EPA has agreed that institutional controls will prevent exposure to, and therefore risk from, contaminated groundwater. Moreover, even in the absence of such controls, the Agency has admitted that it is extremely unlikely that the aquifer can be cleaned up to referenced levels.

Third, EPA's assumption that the Complex has been stripped is unreasonable, given current capping and EPA's ability to use institutional controls to limit infiltration should the use of Complex property change.

EPA Response: The risk assessment that EPA utilized was not flawed. The assumptions used ensure that a protective remedy will result. Additionally, the risk assessment was not the only tool that EPA utilized to set the soil cleanup goals. In addition to mitigating the risks posed by the contamination in the aquifer, Section 121(d) of CERCLA requires that the remedial action attain legally applicable or relevant and appropriate requirements set by state and federal laws. At Kellogg-Deering, EPA has determined that MCLs are relevant and appropriate throughout the aquifer. Further, EPA has determined that restoration of the groundwater is required to achieve them.

The cleanup levels were also set to ensure that leachate generated by water percolating through the contaminated soil would not result in unacceptable groundwater contamination (i.e., MCLs), and to meet the RCRA closure requirements.

If the present Well Field treatment system were not in use, the chemical contaminants in the aquifer could pose a risk to human beings. Human beings could be exposed to site contamination by drinking the water, skin contact or inhalation of contaminants while showering if there were no treatment system at the Well Field or if drinking water wells were installed in the area of groundwater contamination.

As responded to earlier, the MCL for TCE is a relevant and appropriate standard in groundwater and is the goal of the remedy. Although PCE does not have a MCL, 5 ppb is an appropriate cleanup level. This level was selected to be protective and because PCE has chemical, physical and toxicological properties that are similar to TCE.

Contrary to the statement in the comment, EPA has not admitted that the cleanup goals for TCE and PCE can not be met. The remedy, utilizing soil and groundwater treatment, is an aggressive cleanup that can achieve these goals. Institutional controls would not attain ARARs and are therefore not an acceptable remedy for the site. Also, given the potential failure of institutional controls, institutional controls alone would not provide for adequate protectiveness.

Contamination in Soil

21. **Comment:** The contaminants in the groundwater, soil, and soil gas under the Complex are in equilibrium. Hence, a portion of the contamination detected in the soil gas is a result of off-gassing from the contaminated groundwater and does not reflect contamination from a soil source. EPA does not determine the extent to which soil gas reflects primary contamination above the water table, rather than secondary contamination caused by off-gassing from contaminated groundwater. In other words, soil contamination at the Complex is likely, to a large extent, to be a lingering residual effect rather than a continuing cause of groundwater contamination.

Because of the potential for this groundwater off-gassing effect, soil cleanup may not be effective until groundwater remediation at the Complex has been largely completed. Otherwise, the soils could be continually recontaminated. Although EPA recognizes this in the Supplemental RI/FS, it nevertheless uncritically concludes, erroneously, that the short-term effectiveness of in situ vacuum extraction at the Complex is high.

EPA Response: EPA concurs that the contamination found in the soil, soil gas and groundwater is in equilibrium; however, the chemicals in the soil at the Complex are a continuing source of contamination to groundwater. The concentrations of TCE and PCE measured in the soil gas study were greater than could be caused by off-gassing from the groundwater. The release of very concentrated spent solvents from the ground surface into the soil accounts for the observed levels.

The remediation of the aquifer at Kellogg-Deering requires both the vacuum extraction of soil and pump-and-treatment for groundwater to be effective. This two-component source control remedy will remove contamination from the highly contaminated soils at the Complex and in the groundwater flowing from that area, and will result in the rapid remediation of the aquifer. The operation of the remedy will take into account the potential of re-contamination by off-gassing. The pumping and treatment of groundwater and vacuum extraction of the contaminated soil will be sequenced to prevent contamination from moving from the groundwater back to clean soil.

22. **Comment:** Under current site conditions, the amount of TCE contamination in the soil is relatively small and immobile in comparison to the amount of TCE contamination in the groundwater. Moreover, only a small percentage of the contamination in the soil beneath the Complex buildings is likely to enter the groundwater. A large portion of the area is covered by buildings and asphalt parking lots which prevent precipitation from filtering into the ground and entraining contaminants into the groundwater. The only contaminated soil that would release contaminants into the groundwater is that small volume of soil flushed by the groundwater through seasonal fluctuations in the water table.

Any soil contaminants released into the groundwater will be intercepted and treated by the source area groundwater treatment system. Thus, any contaminants in the soil will not migrate off-site and will not adversely affect human health or the environment. Therefore, collecting and treating groundwater at the Complex will intercept any soil contamination entrained into the groundwater and will effectively reduce the majority of the mobile contamination at the Complex. Eventually, the flushing of the soil contaminants by the fluctuating water table should substantially cleanse the soil and minimize any remaining soil source. Although failure to treat the soil now may result in the need for a longer groundwater pump and treat period at the source area, the additional operation and maintenance operations are less costly, and equally effective, as the soil treatment proposed by EPA.

EPA Response: The concentrations and amount of TCE found in the soil is significant and acts as a continuing source of groundwater contamination. To achieve MCLs in the aquifer, a combination of contaminated soil remediation and groundwater treatment will be needed. Although the source area groundwater treatment system will intercept some of the contamination released from the soil, without the soil remediation component of the remedy, the soil will act as a continuing source of contamination and will result in unacceptable aquifer restoration times. Additionally, the RCRA closure requirements for the soil will not be met by groundwater treatment alone.

Although the paved parking lots at the Complex may reduce some of the rainwater that infiltrates into the soil, relying on this as part of the remedy is unacceptable. Some significant amount of water still washes through the soil and there is no long-term way to ensure that the parking lots will remain in-place and that institutional controls will be complied with.

23. **Comment:** Because of questions regarding the integrity of analytical data for 17 soil samples, analyzed in a mobile laboratory, EPA should reevaluate the conclusions in the RI/FS based on those 17 samples.

EPA Response: EPA has re-evaluated how the samples were used in the RI/FS and determined that they do not affect the conclusions that the Agency reached regarding the nature and extent of contamination or have any bearing on the evaluation and selection of the remedy. Besides these samples, EPA relied on validated, accurate data from hundreds of samples collected at the site since work began in 1984.

Applicable or Relevant and Appropriate Requirements (ARARs)

24. **Comment:** EPA has misidentified and misapplied ARARs for soils at the Complex. It is unclear from the preferred remedy exactly what cleanup criteria EPA seeks to impose at the Complex, as the Supplemental RI/FS sets forth different numbers in different places. For example, soil cleanup goals for TCE are stated to be between 12 and 358 ppb in the text, but are identified variously as 6.5 ppb and between 6.9 and 151 ppb in the design calculation appendix. It is clear, however, that whatever numbers EPA is using, it considers them to be driven by RCRA closure standards, which the Agency identifies as an action-specific ARAR for soils, although "applicable" or "relevant and appropriate" is unclear.

RCRA closure standards are clearly not applicable if, as in this case, a RCRA hazardous waste is not newly placed at a site after the effective date of the closure standards. Moreover, the RCRA closure standards do not require treatment or removal of wastes to comply with closure requirements. Instead, waste can be left in place, provided that post-closure groundwater monitoring of the type proposed by EPA for this site occurs.

EPA Response: The soil cleanup levels were developed using a soil/water sorption coefficient which describes the distribution of chemicals between soil and groundwater. They were set in order to reduce the potential future risk to public health and the environment and to protect groundwater by reducing contamination levels to the point where they no longer contribute to groundwater contamination above MCLs. The ranges are given because the soil types differ within the area of soil contamination. The particular type of soil and amount of organic carbon present in the soils attenuate contaminant migration and result in the different cleanup goals provided.

The closure standard cited above refers to landfill closure and not to the closure standards which EPA utilized. EPA has determined that portions of the RCRA regulations on closure that require decontamination of soils are relevant and appropriate for the site (40 CFR 264.110 - 264.120). EPA determined that the release of hazardous substances at the site was similar to releases regulated by RCRA and because of this, closure performance standards under RCRA are both relevant and appropriate for the cleanup.

25. **Comment:** EPA has misidentified and misapplied applicable or relevant and appropriate requirements for source area groundwater remediation. The Agency wrongly relies on inappropriate cleanup standards, given that there is virtually no risk-based justification for source area remediation.

SDWA's MCLs are inappropriate as ARARs given CERCLA's Section 121(d) requirement that cleanup criteria selection must consider the "circumstances of the release," the characteristics of the remedial action, the physical circumstances of the site, the type of place regulated, and the objective and origin of the requirement. Judged by these criteria, MCLs are not relevant and appropriate requirements for restoration of the study area aquifer.

EPA Response: It is within EPA's authority to determine ARARs at the site and to determine cleanup levels necessary to attain those ARARs. With respect to achieving drinking water standards in the aquifer, EPA states in 40 CFR Part 300, National Oil and Hazardous Substances Pollution Contingency Plan; Proposed Rule (Fed. Reg. 53:51394-51520, December 21, 1988) that "it has been the policy of EPA's Superfund program for several years to operate within the framework of EPA's Groundwater Protection Strategy in determining the appropriate remediation for contaminated groundwater at CERCLA sites". The water supply wells are located in an aquifer that is classified as II-A under the EPA Ground Water Protection Strategy. This classification means that the groundwater is currently and potentially a source of drinking water and other beneficial uses. EPA states further that, "for groundwater that is or may be used for drinking water (Class I or II), the maximum contaminant levels (MCLs) set under the Safe Drinking Water Act or more stringent promulgated State standards are generally applicable or relevant and appropriate standards" (ARARs). The aquifer at Kellogg-Deering is a valuable resource both under EPA's Guidelines for Ground-Water Classification and under the State classification for groundwater, which classifies the aquifer as Class GAA at the Well Field -- the State's most stringent classification for groundwater protection -- and GB/GA in other portions of the aquifer at the site, which indicates that although the groundwater presently may not be suitable for direct human consumption without treatment due to chemical contaminants or land use impacts, the State maintains a goal to restore the groundwater to drinking water quality. Given these factors, EPA has determined that MCLs are relevant and appropriate to aquifer remediation at the site.

There are six limited circumstances where ARARs may be waived under CERCLA § 121(d)(4). These are:

> i) the remedial action selected is only part of a total remedial action that will attain such level or standard of control when completed;
>
> ii) compliance with such requirement at that facility will result in greater risk to human health and the environment than alternative options;
>
> iii) compliance with such requirements is technically impracticable from an engineering perspective;
>
> iv) the remedial action selected will attain a standard of performance that is equivalent to that required under the otherwise applicable standard, requirement, criteria, or limitation, through use of another method or approach;
>
> v) with respect to a State standard, requirement, criteria, or limitation, the State has not consistently applied (or demonstrated the intention to consistently apply) the standard, requirement, criteria, or limitation in similar circumstances at other remedial actions within the State; or
>
> vi) in the case of a remedial action to be undertaken solely under section 104 using the Fund, selection of a remedial action that attains such level or standard of control will not provide a balance between the need for protection of public health and welfare and the environment at the facility under consideration, and the availability of amounts from the Fund to respond to other sites which present or may present a threat to public health or welfare or the environment, taking

into consideration the relative immediacy of such threats.

None of these six conditions apply at the Kellogg-Deering Well Field Superfund site. Thus, EPA is justified in setting action levels that will result in the attainment of MCLs in the aquifer throughout the site.

26. **Comment:** If EPA does treat MCLs as relevant and appropriate requirements, it should waive the requirement that they be met pursuant to CERCLA Section 121(d)(4), as complete restoration to health-based levels is not feasible here where EPA has determined that contaminants have migrated into fractured bedrock with low transmissivity. EPA recently waived groundwater ARARs in the Sullivan's Ledge Record of Decision (ROD) because there, as here, contamination was located in difficult-to-locate bedrock fractures. An EPA decision not to waive groundwater ARARs in this instance would be arbitrary and capricious, given the dictates of its own guidance and the factual similarity with bedrock contamination at Sullivan's Ledge.

EPA Response: EPA is aware of the difficulty in predicting the performance of the groundwater remedies, especially for sites that have complicated hydrogeology and contamination transport mechanisms. However, EPA will not waive MCLs in this ROD because the statutory criteria for a waiver of ARARs, as set forth in EPA's response to the preceding question, has not been met.

Although EPA waived some requirements for groundwater cleanup at Sullivan's Ledge, the aquifer at that site is not a drinking water supply source like Kellogg-Deering and a number of different site conditions exist.

27. **Comment:** EPA misapplies the RCRA groundwater protection standards as relevant and appropriate for the Kellogg-Deering site. The RCRA standards require compliance at the edge of a discrete waste management area for containment and early detection reasons that do not apply to a Superfund site where contamination has already spread beyond a source boundary.

EPA Response: EPA did not misapply the RCRA groundwater protection standards. Although the remedy was developed to meet the closure requirements of 40 CFR 264.111 and attain MCLs and state ARARs in the aquifer, EPA also determined that the RCRA groundwater protection standards are relevant and appropriate.

Under RCRA regulations, the groundwater protection standard establishes a safe level of contamination in groundwater in the vicinity of a waste disposal site. Under these regulations, the protection standard can be set at MCLs, ACLs or at background. EPA has determined that the release of hazardous substances at the site was similar to releases regulated by RCRA. Therefore, EPA has determined that MCLs are relevant and appropriate at the site.

In addition to the groundwater protection standard, Subpart F provides relevant and appropriate groundwater monitoring requirements and procedures that EPA will utilize in the remedy (40 CFR 264.97 through 264.99).

28. **Comment:** EPA has also misidentified the Connecticut Water Quality Standards for groundwater as an "applicable" requirement at Kellogg-Deering. "Applicable" standards or requirements must be enforceable, and a review of the WQS statute reveals that the standards are neither requirements nor legally enforceable. Moreover, the WQS require that groundwater be restored to drinking water quality without treatment only "whenever feasible" and "to the extent possible." Given the admitted technical impracticability of remediating Kellogg-Deering groundwater to MCL standards, WQS cannot be considered an ARAR from groundwater remediation.

EPA Response: Section 121(d)(2)(A) of CERCLA, as amended, states that remedies must comply with "any promulgated standard, requirement, criteria, or limitation under a State environmental or facility siting law that is more stringent than any Federal standard, requirement, or limitation" if applicable or relevant and appropriate to the hazardous substance or release in question. EPA proposes in 40 CFR Part 300, National Oil and Hazardous Substances Pollution Contingency Plan; Proposed Rule (Fed. Reg. 53:51394-51520, December 21, 1988) "to define promulgated State requirements as those laws or regulations that are of general applicability and are legally enforceable." "The phrase 'legally enforceable' refers to State regulations that are statutes which contain specific enforcement provisions or are otherwise enforceable under State law. EPA expects that State laws or standards which are considered potential ARARs have been issued in accordance with State procedural requirements. The phrase 'of general applicability' is meant to preclude consideration of State requirements promulgated specifically for one or more CERCLA sites as potential ARARs . . . For a State requirement to be a potential ARAR it must be applicable to all remedial situations described in the requirement, not just CERCLA sites. General State goals that are contained in a promulgated statute and implemented via specific requirements found in the statute or in other promulgated regulations are potential ARARs. "

EPA has determined that the Connecticut Water Quality Standards are applicable to aquifer restoration at the Source Area to the extent that they provide a level or standard of control that is promulgated and more stringent than Federal requirements. The aquifer at Kellogg-Deering is a valuable resource both under EPA's Guidelines for Ground-Water Classification and under the State classification for groundwater, which classifies the aquifer as Class GAA at the Well Field, the State's most stringent classification for groundwater protection, and GB/GA in other portions of the aquifer at the site. The GB/BA classification indicates that although the groundwater presently may not be suitable for direct human consumption without treatment due to chemical contaminants or land use impacts, the State maintains a goal to restore the groundwater to drinking water quality. The Connecticut Water Quality Standards were adopted pursuant to Connecticut General Statutes 22a-426 and are enforced by the State through other provisions in Title 22. The Water Quality Standards are of general applicability and apply to all remedial situations described in the requirement, not just CERCLA sites. For the reasons stated above, the Connecticut Water Quality Criteria are applicable to the cleanup of the aquifer to the extent that they provide a level or standard of control that is promulgated and more stringent than Federal requirements.

29. **Comment:** If the Connecticut Water Quality Standards are considered ARARs, they should be waived, for the same reasons that MCLs should be waived as detailed above. Furthermore, CERCLA authorizes the waiver of state standards that have not been consistently applied, or demonstrated an intention to consistently apply, the standard in similar circumstances at other remedial actions. Connecticut has not applied the WQS consistently at similar sites, nor has it demonstrated any intention of applying them consistently in the future.

EPA Response: It is within EPA's authority to determine the ARARs for the site and to determine when a waiver is appropriate. As stated in EPA's response to comment number 25 above, there are six potential circumstances in which a waiver may apply. EPA has determined that none of these six conditions apply at the Kellogg-Deering Well Field Superfund Site.

Remedy Components

30. **Comment:** Although EPA has determined that vapor phase carbon adsorption will be used to treat emissions from the

in situ vacuum extraction system, it does not justify this requirement. If one were to calculate the maximum allowable stack concentration for TCE under Connecticut Air Pollution Control regulations using EPA's design parameters for the extraction system's air discharge rate, the maximum allowable stack concentration would be no less than 88 ppm by volume (ppmv).

EPA Response: Carbon adsorption will be used for the vacuum extraction system to ensure that the hazardous substances are treated to the maximum practicable and to ensure protectiveness consistent with OSWER Directive 9355.028 and Region I guidance.

31. **Comment:** Although EPA's preferred remedy ostensibly leaves open the possibility that source area groundwater may be discharged to the Norwalk River or the local publicly-owned treatment works (POTW), or injected into the aquifer, EPA analyzes alternative groundwater remedial components using only the Norwalk River option, which requires piping the treated water to the Norwalk River south of the Well Field. EPA's rationale that discharges upstream of the Well Field would have to meet MCLs is not supported by any analysis.

As the Agency notes, discharge from both source and downgradient air strippers would meet appropriate water quality criteria in the Norwalk River, and projected in-stream TCE concentrations comply with the standards of the Connecticut Discharge Permit Regulations and risk-based calculations for consumption of aquatic organisms from the Norwalk River.

EPA Response: The method for disposal of treated groundwater will be determined during Remedial Design. The method of disposal specified in the FS was used for costing and as a basis for the comparison of the other alternatives.

Options that will be considered in the design individually or in combination include 1) reinjection back into the aquifer, 2) discharge into the Norwalk River through a new pipe, 3) discharge to the Norwalk River through existing storm sewers, or 4) discharge to the local Publicly Owned Treatment Works (POTW). The treatment standards will comply with the applicable or relevant and appropriate requirements for the disposal or discharge method chosen.

32. **Comment:** EPA has prematurely and erroneously determined that air emission control is necessary for groundwater source area air stripping. It is impossible to determine, without further design, whether a source area air stripper would violate Connecticut Air Pollution Control requirements without air emission treatment. It is not possible to

accurately determine whether an air stripper will meet maximum allowable stack concentrations before the air stripper actually goes on line or is pilot tested, since input variables to the maximum allowable stack concentration calculation (e.g., air emission rate) will not be known until that time.

The RI/FS acknowledges that the calculated air stripper emissions fall below the level requiring carbon off-gas filters, but then proceeds to call for them anyway. There is no ARAR or risk-based justification for the use of carbon off-gas filters at either the Complex or the Well Field.

EPA Response: Air emission control by carbon adsorption will be used for the vacuum extraction system to ensure that the hazardous substances are treated to the maximum practicable and to ensure protectiveness consistent with OSWER Directive 9355.028 and Region I guidance.

33. **Comment:** Areas chosen in the RI/FS for extraction wells do not exhibit contamination action levels chosen elsewhere in the RI/FS.

EPA Response: The exact number and location of the extraction wells and their respective pumping rates will be determined in the remedial design to attain the cleanup goals of the remedy. The proposed configuration in the RI/FS was appropriate for the development and relative comparison of groundwater treatment alternatives.

34. **Comment:** The RI/FS states "no reliable estimates can be made for the overall remediation time required." (p. 358) The only guess exceeds thirty years, but EPA does not really know. This willingness to begin pumping and treating groundwater is unjustified in light of the questionable effectiveness of the system and EPA's inability to determine how soon the aquifer would clean itself. It is possible that natural flushing would be faster without pumping and treating.

EPA Response: Pumping and treating contaminated groundwater will be effective in reducing the size of the plume and the mass of contaminants in the aquifer. Moreover, this will enhance natural flushing of the aquifer. EPA believes that approximately 2.5 years will be needed to remediate the soil at the Complex and, although the time needed to remediate groundwater can not be precisely set, pumping and treating groundwater may have to be operated for ten or more years.

35. **Comment:** The RI/FS does not discuss the potential impact of extensive pumping of the overburden and bedrock aquifers in the source area, and subsequent reinjection. Such pumping

and reinjection in a concentrated area has been shown to cause structural failure of foundations and other rigid structures as a result of the subsidence and mass movement of sediment, extensive water damage of structures and even micro-seismic events.

EPA Response: Subsidence is not expected to be a problem. Also, the design of the remedy will take these factors into account and will be developed to avoid de-watering that could result in structural damage and subsidence.

Institutional Controls

36. **Comment:** The Phase II RI notes risk due to the possibility that future private wells may be drilled near the source of contamination, exposing humans to the contamination. However, Connecticut state law requires all properties within 200 feet of a public water supply system to hook up to that system, and does not allow the installation of private wells under such circumstances. These institutional restrictions are present here and are unlikely to change given the areas's recognized contamination and impracticability of restoring the aquifer to MCLs.

EPA Response: EPA chose the cleanup because CERCLA requires the selection of permanent remedies that employ treatment to reduce the mobility, toxicity or volume of the contamination (if such a remedy is practicable), over remedies like the one outlined above that rely on non-treatment based mechanisms such as institutional controls and containment.

Additionally, institutional controls would not attain ARARs (e.g., MCLs and RCRA closure requirements) and is, therefore, not an acceptable remedy for the site. Also, given the potential failure of institutional controls, without adequate engineering controls institutional controls alone would not provide for adequate protectiveness.

State Ordered Groundwater Treatment System

37. **Comment:** Even assuming a hydrogeologic connection to the Well Field, source area remediation is not necessary because the RI/FS has determined that the Well Field air stripper can meet Safe Drinking Water Act (SDWA) MCLs even under "reasonable worst case scenarios." The State-ordered treatment system at the Complex provides a further safety margin.

EPA Response: As discussed in a number of earlier responses, the selected remedy provides that MCLs must be attained throughout the aquifer, not only at the Well Field. The State-ordered groundwater treatment system, even in combination with the well head treatment, will not attain ARARs or EPA's remedial objectives at the site.

38. **Comment:** The RI/FS does not explain why the groundwater treatment and extraction system installed under the DEP order is not sufficient for source area remediation.

EPA Response: The RI/FS prepared by EPA developed and evaluated a range of cleanup alternatives to restore the aquifer at the Kellogg-Deering site. The system installed pursuant to the State Order addresses only a limited portion of the highly contaminated portion of the aquifer and does not provide for soil treatment. Therefore, it is unlikely that the system can meet EPA's cleanup goals -- it would not intercept enough of the contaminated groundwater to achieve a cleanup to MCLs. However, as part of the remedy's design, EPA will consider use of the system installed under the DEP order and, if possible, will incorporate it into EPA's cleanup plans.

Alternative Remedies

39. **Comment:** A number of alternative remedies were proposed that the PRPs contended were more cost-effective than the selected remedy. The first would modify the existing Well Field air stripper, or add another stripper, to ensure that water extracted from the Well Field continues to meet risk-based standards in the event that contaminant levels increase at the wellhead.

EPA Response: For any alternative to be more cost-effective, it would have to achieve the same results as the selected remedy but at lower cost. None of the proposed alternatives do this. Further, EPA determined that the selected remedy will yield results that are in proportion to its cost in terms of the implementability and protectiveness.

The premise of this first alternative is that MCLs do not have to be attained throughout the aquifer but only at the Well Field. Again, as discussed earlier, at Kellogg-Deering EPA has determined that MCLs are relevant and appropriate throughout the aquifer and that restoration of the groundwater is required to achieve them.

40. **Comment:** A second alternative remedy would have the following components:

- The groundwater pump and treat air stripping system approved by DEP at the Complex, which will clean up the highest contaminant levels observed in the study area and prevent the unlikely possibility that soil contaminants migrate into groundwater and then move offsite;

- Discharge of treated groundwater from the Complex air stripper into the storm sewer, which flows into the Norwalk River;

- Continued operation of the existing Well Field air stripper until contaminant levels entering the Well Field distribution system drop below safe drinking water levels without treatment by the stripper;

- Removal of any contaminated flooring and sealing of any flooring cracks within the southernmost building at the Complex as necessary to minimize exposure to any possible air emissions from contaminated soil gas beneath the building;

- Institutional controls 1) at the Complex to prevent direct exposure to soil contaminants, and 2) throughout the study area to prevent use of unsafe contaminated groundwater; and

- Necessary and cost-effective monitoring of concentrations of VOCs in 1) groundwater to determine the effectiveness of the cleanup effort and 2) air inside the southernmost building at the Complex to ensure that acceptable concentration levels exist.

EPA Response: This alternative is based on the premise that either the determination that MCLs are not ARARs throughout the aquifer, or if they are ARARs, then they should be waived.

Again, as discussed earlier, EPA has determined that MCLs are relevant and appropriate throughout the aquifer. Further, EPA has determined that restoration of the groundwater is required to achieve them and to provide a protective remedy.

In light of the criteria that EPA uses to evaluate remedial alternatives, this proposed remedy is not acceptable because it would not satisfy the statutory and regulatory criteria for CERCLA cleanups, including, but not limited to, providing acceptable overall protectiveness and long-term effectiveness, or attaining ARARs.

Although EPA is aware of the difficulty in predicting the performance of the groundwater remedies; EPA will not waive MCLs because the Kellogg-Deering aquifer is a significant resource utilized as a public drinking water source and because the statutory criteria for a waiver have not been met.

41. **Comment:** The third alternative remedy proposes the following remedial actions:

- Air quality

  1. Fill the pit and trenches in the Elinco building;
  2. Remove the TCE contaminated wood and sandblast or encapsulate contaminated floor areas, or remove wooden flooring as necessary;
  3. Monitor air quality to ensure compliance with applicable OSHA standards;
  4. Modify building ventilation if standards are violated.

- Soil

  1. Impose land use controls on the Complex to prevent site cover stripping and abandoning as outlined in the RI/FS;
  2. Address soil contamination at the time of future site development.

- Source area groundwater

  1. Place into operation the existing groundwater treatment and extraction system, with a goal of contamination levels of 5 ppb or less in water flowing into the Well Field;
  2. Monitor system performance as an aid to information gathering.

- Downgradient groundwater

  Given the problems of intercepting specific bedrock fractures, and the RI/FS's assumption of institutional controls to prevent installation of wells on the east side of the river, any groundwater treatment program should treat water in the overburden aquifer, rather than in the bedrock.

EPA Response: This alternative is not acceptable. It relies on the State-ordered groundwater treatment system which will not meet ARARs or EPA's remedial objectives at the site. Land-use institutional controls would not attain ARARs or prevent further groundwater contamination.

Again, as discussed earlier, EPA has determined that MCLs are relevant and appropriate throughout the aquifer.

Further, EPA has determined that restoration of the groundwater is required to achieve them and to provide a protective remedy.

In light of the criteria that EPA uses to evaluate remedial alternatives, this proposed remedy is not acceptable because it would not satisfy the statutory and regulatory criteria for CERCLA cleanups, including, but not limited to, providing acceptable overall protectiveness and long-term effectiveness, or attaining ARARs.

42. **Comment:** The following case was made for the No-Action alternative:

> The RI/FS erroneously focused exclusively on remedial activities only where the contamination is actually located. The RI/FS implicitly assumes that in assessing whether a remedy accomplishes a reduction in mobility or toxicity of a substance the focus must and can only be on accomplishing these goals at the contamination location.
>
> However, nothing in CERCLA or the National Contingency Plan dictates this focus. In the present case, the Well Field air stripper accomplishes all goals of permanently and significantly decreasing the toxicity, mobility, and volume of TCE. To be sure, the Well Field treatment system would not stop the spread of contaminants towards the Well Field. But by using a wider geographic area, an area that extends beyond where the contamination is found, the no action alternative would meet all remedial action requirements without any further remedial work. The no action alternative would decrease the mobility, toxicity, and volume of TCE moving past the Well Field, and satisfy both CERCLA and the NCP.

EPA Response: The No Action alternative was not selected by EPA because it did not meet the statutory and regulatory criteria for selection of a remedy. First, it would not be protective of human health and the environment. Second, there would be no reduction of the mobility, toxicity and volume of contaminants in the unsaturated soils of the complex. The mobility of the contaminants in groundwater would not be reduced. The toxicity and volume of contaminated groundwater would not be reduced except by well head treatment, and finally, this alternative would not provide long-term effectiveness or permanence or attain groundwater or RCRA closure ARARs.

Remedy Selection Process

43. **Comment:** EPA has not shown how or why its proposed expenditure of 13 million dollars will provide any more protection to human health or the environment than that currently being provided by the Norwalk First Taxing District's (NTFD) treatment system.

The RI/FS Section 6 confirms that treated water leaving the Kellogg-Deering Well Field does not pose any threat to human health or the environment. Further, existing site conditions as a whole pose a cancer risk of 1 in 360,000,000 to an individual with lifetime exposure to the site. For non-carcinogenic risks, the hazard index is well below 1.0 and non-carcinogenic effects are thus also unlikely. In short, there is no health risk posed by the site as it currently exists.

The only risk-based justification EPA offers for remedial work relies on future (worst-case) and future (plausible case) scenarios. However, the assumptions underlying both scenarios are so untenable that reliance on them would constitute a capricious and insupportable basis for further action.

EPA Response: EPA agrees that the treatment system currently operated at the Kellogg-Deering Well Field protects public health. If, however, private wells were installed in the area of groundwater contamination or the treatment system were not in use, due to equipment failure, or otherwise, the chemical contaminants in the aquifer could pose a risk to human beings. Human beings could be exposed to site contamination by drinking the water, skin contact or inhalation of contaminants could occur while showering if there were no treatment system at the Well Field or if drinking water wells were installed in the area of groundwater contamination.

In addition to mitigating the risks posed by the contamination in the aquifer, Section 121(d) of CERCLA requires that the remedial action attain legally applicable or relevant and appropriate requirements set by state and federal laws. At Kellogg-Deering, EPA has determined that standards, called Maximum Contaminant Levels (MCLs), set under the federal Safe Drinking Water Act are relevant and appropriate throughout the aquifer. Further, EPA has determined that restoration of the groundwater is required to achieve them. In addition to the federal standards that the remediation must attain, the cleanup of the aquifer must meet State ARARs.

44. **Comment:** EPA has not met the CERCLA Section 121 requirement for a cost-effective remedy. EPA's costs are based on a thirty-year remediation estimate that has no rational basis in light of its admission that "no reliable estimates can be made for the overall remediation time required." (RI/FS p. 358.) Without a remediation time frame, one cannot rationally estimate remedial cost, and thus one cannot determine whether the proposed alternative is cost effective within the meaning of CERCLA Section 121.

Further, the uncertain cost must be compared to existing site conditions, under which the air stripper at the Well Field is removing any threat to human health. This comparison demonstrates that EPA has not justified the cost effectiveness of the preferred alternative.

EPA Response: EPA has determined that the selected remedy will yield results that are proportionate to its costs in terms of implementabliity and effectiveness.

Thirty years is not the estimated remediation time for the remedy. Instead, thirty years is a basis for a present-worth analysis that EPA used for cost estimating. Present-worth, also called present-value, is a cost accounting technique that sums the cost of a remedy that may take a number of years to complete as a total in today's dollars. This gives a common basis (a present-worth) to compare alternatives that have different project lives.

Thirty years is used in the estimate because costs incurred after thirty years are relatively insignificant in terms of their present-worth and do not affect the comparison of different alternatives.

As an example of the insignificance of expenses incurred after thirty years in the present-worth analysis, if the cost to operate a remedy is $100,000 per year, the thirty-year present-worth of this is equal to $9,427,000. If, however, the remedy is operated for another year, only about $5,700 (0.06%) is added to the present-worth total.

45. **Comment:** The energy cost of the proposed alternative is high, especially given the uncertainty of its effectiveness and the limited additional protection it affords. A total energy usage for the preferred alternative has not been included in the RI/FS. No specific energy cost appears associated with the in-situ soil treatment component of the proposed remedy although the system surely uses energy. For groundwater treatment, the RI/FS assumes a total energy

usage of 365,810 kilowatt-hours per year. This translates into about 810 barrels of oil per year, assuming 450 kWh/barrel, or more than 24,000 barrels of oil over 30 years.

This energy use raises serious policy questions about whether it is worth depleting one natural resource to clean another. In the present case, this decision is made somewhat easier by the operating treatment system and its removal of any threats to human health. Without such a threat, use of excessive amounts of natural resources on a highly uncertain cleansing system cannot be justified.

EPA Response: Although energy costs are not itemized for the soil treatment, these costs are included as part of the estimated operating costs that are provided.

No serious policy questions arose over implementing the Kellogg-Deering remedy at the expense of the world's oil reserves.

B. SUMMARY OF COMMENTS FROM THE STATE, CITIZENS AND OTHER INTERESTED PARTIES

Connecticut Department of Environmental Protection

1. **Comment:** The cleanup goal concentrations cover broad ranges, up to two orders of magnitude, and the proposed plan does not specify a procedure for selecting remedial goals from the cleanup goals.

   EPA Response: The soil cleanup levels are ranges because the soil types differ within the area of soil contamination. The particular type of soil and amount of organic carbon present in the soils attenuate contaminant migration and result in the different cleanup goals provided. The specific goals were set with a soil/water sorption model. Details of this are provided in the Remedial Investigation and Feasibility Study reports. The cleanup goals derived from the model will insure that MCLs are not exceeded in the groundwater as a result of soil leaching.

2. **Comment:** The Connecticut Department of Health Services has established an action level of 1,000 micrograms per liter for toluene in drinking water supplies. To properly reflect the state's more stringent standards, the site cleanup standard should be 1,000 and not 2,000 micrograms per liter.

EPA Response: The Connecticut Department of Health Services action level is not an ARAR because it has not been promulgated.

Local Citizens and Other Parties

1. **Comment:** The Proposed Plan states that wells containing TCE were shut down in 1975, and restarted when the NFTD Water Department installed treatment systems in 1981. However, numerous newspaper articles from 1984 and 1985 report citizen demands that contaminated wells be shut down and treatment initiated, and some citizens believe that aeration did not begin until 1987.

   EPA Response: Treatment at the Well Field was started in May of 1981 by the Norwalk First Taxing District (NFTD). In 1988, further pollution controls were installed at the Well Field.

2. **Comment:** The NFTD did not notify its customers when the contamination was first found. What will be done to insure that future contamination is not kept secret for years?

   EPA Response: The Norwalk First Taxing District (NFTD) is required to report contamination that they find to the Connecticut Department of Health Services.

3. **Comment:** The November 1980 letter to NFTD Water Company customers listed as contaminants 1-4 dioxane, methylethylketone or ethylene glycol, yet the RI/FS did not mention these chemicals.

   EPA Response: EPA did not find these chemicals in its testing. The contaminants EPA did find that cause the problems at the site are trichloroethene, commonly called TCE, and perchloroethene, or PCE.

4. **Comment:** The construction of the new Route 7 so close to the Well Field and above the aquifer worries some residents. Particular concerns include the alleged use of junked cars as fill, Connecticut DOT's oil storage at the construction site, current illegal dumping near the Well Field, chemical spills from trucks that will use the highway, and salt use in the winter.

   EPA Response: Although these are all valid concerns and should be addressed, this ROD and Responsiveness Summary address the selection of a remedy fro the Source Area.

5. **Comment:** According to several residents, the RI/FS does not reflect the full history of the area. The following information was provided:

   1. The area bounded to the north by Broad Street, to the east by the Norwalk River, to the south by East Lakeview Drive and Nutmeg Place, and to the west by Lakeview Avenue was a large pond until 1965, when it was filled in.

   2. The area now known as Kellogg-Deering Pond has long been used as a dumping ground by residents and local businesses. The configuration of the pond has changed many times, and a 1970 map shows the pond covering the current location of the Well Field.

   3. The area between Wesco Ford and the Norwalk River was once a wetland lying just above the river, and was used until 1981 as a dumping ground for a variety of objects including cars, appliances, and drums. Numerous other areas along the river have been filled, sometimes with a variety of waste. Possibly contaminants are leaching from these areas, or could leach in the future. In addition, manufacturing plants north of the Well Field have long regarded the river as a waste receptacle, and local residents have long spoken about the tainted river. In short, several possible contamination sites exist in the area and north of the Well Field. Thus, there is concern that the site be constantly monitored even after the cleanup.

   EPA Response: The remedy that EPA has selected will address the significant source of contamination found at the Complex. EPA recognizes the uncertainties in treating groundwater in bedrock and, although EPA believes that the remedy will achieve ARARs and will be protective of human health and the environment, the remedy also relies on the existing Well Field treatment system (the first operable unit ROD for the Site) to ensure protectiveness.

6. **Comment:** Several residents questioned the current safety of the water provided by the NFTD. One believes it unsafe for drinking or any other use. If immediate cleanup does not occur, the resident requests bottled water. Another is angry that the NFTD and the State of Connecticut force him to consume carcinogenic water as long as contaminant levels are kept within recommended ppm limits. He resents having to consume any amount of carcinogenic water and pay for it.

EPA Response: EPA considers the water supplied by the NFTD to be within the standards set under the federal Safe Drinking Water Act and therefore safe to drink.

7. **Comment:** The Norwalk First Taxing District questions its identification as a potentially responsible party, and requests either the reason for its listing or removal from PRP listing. Also, the NFTD requested to be kept informed about work at the site.

   EPA Response: This Record of Decision does not address liability issues, but deals with the selection of the remedy for the Site. Therefore, EPA will not address in detail comments regarding liability. However, the NFTD is a current owner of a portion of the site and therefore, falls within one of the classes of potentially responsible parties under section 107(a) of CERCLA.

   EPA will keep the NFTD informed about the work at the site.

8. **Comment:** A wetlands restoration expert working on the Norwalk River is apparently concerned that either the study or remediation area is not large enough, as he has observed repeated failures of vegetation in Deering Pond and skin irritation from water contact. He suspects chemical contamination is responsible and not addressed in the RI/FS.

   EPA Response: The studies done by EPA and the cleanup plans address the contamination of the Kellogg-Deering aquifer. The scope does not include Deering Pond at this time. However, remediation of the aquifer will improve, to some degree, surface water quality throughout the area. EPA intends to further evaluate surface water quality in the future.

9. **Comment:** No mention was made about fines against the polluters.

   EPA Response: EPA is considering its enforcement options for the site. In general under Superfund, EPA attempts to recover the money spent on the studies and attempts to get the potentially responsible parties to implement the cleanup work.

EXHIBIT A

EPA COMMUNITY RELATIONS ACTIVITIES CONDUCTED AT THE KELLOGG-DEERING SITE

- EPA issued a press release announcing funding for study of the site
- March 1984, EPA issued a community relations plan identifying community concerns and EPA plans to inform and involve the public in EPA decisions
- July 11, 1989, EPA held a public meeting in Norwalk to discuss study of the site
- October 1985, EPA released a fact sheet describing field studies to date and plans for further investigation
- April 1986, EPA released a fact sheet presenting the results of the remedial investigation of the site
- May 5, 1986, EPA issued a press release announcing the availability of the Remedial Investigation report for public review and announcing a public meeting on the site
- May 22, 1986, EPA held a public meeting to discuss the results of the Remedial Investigation and answer community questions
- June 1986, EPA issued a fact sheet on the results of the Feasibility Study evaluating options for well-head treatment of water pumped from the site
- June 1986, EPA released a revised community relations plan to update information on community concerns and EPA activities planned to inform and involve the public
- July 2, 1986, EPA issued a press release announcing a public comment period on the cleanup options for the site to be held from July 18 - August 7; and announcing EPA's schedule for a public meeting and public hearing on the cleanup options for the Well Field
- July 17, 1986, EPA held a public informational meeting in Norwalk to present results of the Feasibility Study and answer questions
- July 31, 1986, EPA held a public hearing to accept oral comments on the recommendations for well-head treatment

- September 1986, EPA issued a fact sheet and press release describing the well-head treatment option selected for the site

- May 5, 1987, EPA issued a press release to announce an Administrative Order under which the Norwalk First Taxing District would be required to repair, test and operate the air stripping unit at the site

- EPA announced the availability of the Administrative Record for public review in Norwalk, Connecticut and in Boston, Massachusetts

- January 1988, EPA issued a press release announcing plans for a Supplemental Remedial Investigation of the source areas of site contamination, and the availability of the workplan for public review. EPA also released a fact sheet describing the planned supplemental investigation

- July 18, 1989, EPA issued a press release announcing 1) completion and availability of the Feasibility Study; 2) a public comment period (to be held July 27-August 25) on the Feasibility Study and Proposed Plan for the second operable unit at the site; and 3) the schedule for a public meeting and public hearing on the Feasibility Study and Proposed Plan

- July 26, 1989, EPA issued its Proposed Plan recommending a cleanup option to address sources of contamination at the site.

- July 26, 1986, EPA held a public informational meeting in Norwalk to present the results of site study and the Proposed Plan and to answer questions

- August 4, 1989, EPA issued a press release providing information on the public hearing

- August 14, 1989, EPA held a public hearing to accept oral comments on the Proposed Plan to address sources of site contamination

EXHIBIT B

TRANSCRIPT OF THE PUBLIC HEARING KELLOGG-DEERING SITE

UNITED STATES OF AMERICA

ENVIRONMENTAL PROTECTION AGENCY

BOSTON REGION

In the Matter of:

PUBLIC HEARING
EPA PROPOSED CLEANUP PLAN FOR
THE KELLOGG-DEERING SUPERFUND SITE

Norwalk Public Library
1 Belden Avenue
Norwalk, Connecticut

Monday
August 14, 1989

The above entitled matter came on for hearing, pursuant to Notice at 7:40 p.m.

BEFORE: MATTHEW HOAGLAND,
Remedial Project Manager
MARGARET LESHEN,
Connecticut Superfund Section Chief

I N D E X

SPEAKER:	PAGE
Ms. LeSken	2
Mr. Hoagland	5
Mr. Barske	8
Mr. Wolfe	15

PROCEEDING

(7:40 pm)

MS. LESKEN: ...for the Superfund Section, and I want to welcome everyone here to the Public Hearing for the Kellogg-Deering Superfund Site.

Can everyone hear me? Just so everyone knows, these are mikes for transcribing the meeting. They are not amplifying mikes. So if you need us to talk louder, just let us know.

I'm going to just tell you about what we're going to be doing tonight.

It is -- the meeting is going to be broken into three parts. Matt Hoagland, the Project Manager, is going to make a very brief presentation about the proposed plan and preferred alternative for the site.

He did come down here July 26th. So you did get an opportunity to hear a more detailed presentation and to ask questions.

After Matt makes a presentation, we're going to have the actual formal comment period. At that time, I will call whoever has requested the ability to make a comment up, and they will come up and make their comment into the mikes.

If at anytime during the meeting you decide you want to make a comment, I would ask that you just go to the back or raise your hand, and Will Schreoder (phonetic) from our office will have you fill out a card. We do need to know your names so that we can read it into the record.

After we do that and everyone has a chance to have their -- make their comments into the record, we will close the meeting and stay around for any informal comments and questions -- a short question and answer period.

And as everyone heard at their meeting on -- on the meeting on July 26th, there is a formal public comment period for the Kellogg-Deering Superfund Site for the proposed plan that ran from July 27th to August 25th. You can read your comments into the record tonight on the plan, or you can send written comments to Matt Hoagland, the Project Manager, and his address is on the second page of the proposed plan that we have in the back. If anyone needs any copies of the proposed plan, we can just -- Will can get them to you.

With us tonight, we, also, have Chris Atkinson (phonetic) and Mike Powers from the Connecticut Department of Environmental Protection.

Does anyone have any questions on how the hearing is going to be run tonight?

(Pause.)

MS. LESKEN: Yes?

FROM THE FLOOR: If you don't understand something that's in the report, when can we ask that kind of a question?

MS. LESKEN: In terms of a clarifying question on the report?

FROM THE FLOOR: Yes.

MS. LESKEN: At the end of the meeting.

FROM THE FLOOR: At the end of the meeting?

MS. LESKEN: Yes. When the people are reading the comments or questions into the record, that is a formal part of the hearing, and we will not be responding.

We will be around afterwards to answer any clarifying questions.

(Pause.)

MS. LESKEN: Okay. I don't hear any other questions.

I'm going to have Matt make a very brief presentation about the proposed plan.

MR. HOAGLAND: Okay. I'd like to welcome everyone here tonight.

As I presented it earlier, on July 26th, we have basically two contaminates of concern out at the site. There is trichloromethane and tetrachloroethane.

These are known as volatile organic compounds.

They have been detected in soils beneath the buildings of an area that we call the Elinco/Pitney Bowes/Matheis Court Complex. That's an area that's just on the east side of -- of Main Street, in Norwalk.

Contaminates have also been detected in the indoor air of the buildings, and in ground water of the aquifer.

The EPA's preferred alternative is really in three parts.

The first part is called an in-situ vacuum extraction, which is designed to be used primarily for contaminants in unsaturated soil, soils that are above the ground water table. Those contaminants can be removed using this technology from the soils themselves and also this technology, the EPA believes, will cutoff further introduction of contaminants to the indoor -- into the indoor air of the buildings.

The ground water contamination has been divided into -- the area of ground water contamination has been divided into two zones.

The -- there is a very highly concentrated area of ground water contamination. This is called the source area. The other area that remains -- that's beyond the source area or further downgrade in the source area is called the downgrading area. The source area has higher levels of contamination then the downgrading area.

The EPA's proposed or preferred alternative, as described in the proposed plan, will -- discusses how extraction wells would be placed in both the source and downgrading areas, to extract, and treat, and discharge contaminated ground water. I have three additional points to make.

One is that -- that there is treatment at the Kellogg-Deering wells. This treatment insures that water consumed by the residents is safe to drink.

Two, there is no actual dumping going on -- going on presently, at the Kellogg-Deering site. This dumping or the -- the waste and contaminants that are in the ground and in the ground water were disposed of during a period between -- after World War II and prior to the 1980's.

Three, actual removals of the buildings at the Elias -- the Elinco/Pitney Bowes/Matheis Court Complex were not considered as a feasible alternative, as described in the Supplemental Feasibility Study.

Any thoughts to -- to remove those buildings would have been done to gain better access to the contaminated soils, but I just wanted to point out that that was something that was screened out very early on in the feasibility process, and that's really all I have to say right now.

MS. LESKEN: Okay. We're going to start the actual hearing part of the presentation.

Again, if anyone wants to make a comment, they should just give their card or get a card from Will in the back.

The first person that wanted to speak was Val Wolfe.

(Pause.)

MR. WOLFE: I have no comment.

MS. LESKEN: Oh, none right now.

Okay. The second is P. Barske.

MR. BARSKE: It's Barske.

MS. LESKEN: Barske. If you could come forward?

(Pause.)

MR. BARSKE: The name you have is Philip Barske, Fairfield, Connecticut.

You may wonder why I'm in Norwalk. I've been in Norwalk since 6:30 this morning working near the river.

I've gone through the plan briefly. I'm not a chemist, and I can only hope that the agency has taken the right one, but I do have a little odd experience along this river that I thought would be worth presenting, and I believe I wrote a brief note to Mr. Hoagland.

I've been doing some Army Corps restoration work at Deering Pond, and my concern, basically, is the clean-up plan -- where does it start or where should it start.

Now, I've been involved in wet land work creation for about forty years, and I've never had the odd experience that I had at Deering Pond over the past three years.

Very briefly, I put in some plantings. The first year they failed because there was no base material. Somebody had put seed plant -- upland plants in the water, and, of course, they failed. There was no substrata, so the first year it failed. I wasn't concerned why, other than the geese, the swans, and the muskrats.

The second year, I brought in 100 yards of tested soil from an excavation site in Trumbull, Connecticut. I had that tested by the Baron Laboratories for heavy metals. We put in a planting, and I thought by fall we had a fairly successful vegetative planting which I can illustrate here.

What I'm driving at is vegetative reaction and then some chemical or medical reaction I've noticed from the area.

We would get -- during the period that I planted, when we had low water, we had excellent growth, and on occasion -- I've kept very close notes of this from 7/25/86.

The first year I wipe off because there was no strata -- organic strata. The second year we took care of swans, geese, ad infinitum. When we had an inundation of this vegetation, we have a practically 90% kill.

Now, at that same time, on 7/8/87, when we were planting over the organic matter, I had an odd sense that something was not right there. The odor, feel, and I made everyone wear boots and rubber gloves. There is one young man -- if you see him here, you can see why -- he couldn't wear boots. They just wouldn't fit over his thighs.

He waded in the water, and about three days later -- I don't have pictures of his legs, but his arms and his legs erupted in huge welts, highly irritated, very itchy. Now, that happened in '87.

At that same time, I got above water there, and I got it right in the elbow. That was excised by a dermatologist, and sent to the lab, and found nothing. Evidently it was a chemical burn of some type.

That -- evidently there was some organism or some chemical aspect. You can see the eruptions. Tom's leg from knee up -- ankle -- was covered with this mass of welt.

Well, very briefly, the following year we replanted, had a fairly good growth, until we had high water. With high water, we practically lost all of the growth, and on May 15, the same young man planted for me, and that's when he developed the rash on his hands. That time he had boots. He was fearless, with rubber gloves and he developed that rash again.

Now, since then the plantings have been in poor shape. I worked with plants many years. I have a feeling that something is amiss in this area.

Now, I did talk to Mike Noonan, from the Army Corps. I've forgotten what date. I have it in here.

(Pause.)

MR. BARSKE: Oh, 7/27/87, Mike Shean. He was overseer of this project. I checked with him, told him what had happened. He said that he would contact EPA.

Now, I never heard from anyone. I

contacted Rich LeClair, Dr. Steve Hitchcock, and Brian Kielbana, and then they sent a young man, Michael Cunningham, on 8/17/87, to look at this area.

Now, in the river, itself, I don't know. There is an area we planted. There is one under drain, and while I was working on Route 7, on 7/10 -- 10, 11, I happened to get an aerial photograph of this proposed -- of the highway route, which went right over Deering Pond, and the site that I worked on. That had been a gravel pit and then a dump.

I had talked with a Dr. William Neering, roughly, at that time, and he said that -- you know, that was 7/16/87. I talked to Dr. Neering, and he just said that was irritated here.

Finally, he called me at night, and he said that I had visions of that as a suspected dump site or toxic site. Whether it was or not, I don't know. Michael Cunningham from DEP did come down, and he reported no toxics from this area.

Now, all I can report is the three years that I have watched this area. This year the growth is horrible. At high water, all the spring water, the vegetation just did not come through.

To me there is something in this system. I know I'm beyond the well field area, but I am concerned with this, because thirty years ago I signed the flood control small water shed project for this Norwalk River. I worked in Norwalk a great deal and will be the next couple of weeks.

Working in this area, I just had a sense that something was amiss. It tied in with this program in the same pond area. Now, I won't venture into that thing without boots and rubber gloves. My gloves come up to here now.

My feeling is, "In doing are we neglecting a portion of the violated system of the river?"

Basically, that is all I have to say. I can't comment on the clean-up systems. I do not know proper techniques, but I plan to follow it very carefully. Thank you.

MS. LESKEN: Thank you.

MR. BARSKE: Now, if you want these, they're yours. You may not want them, but--

COURT REPORTER: For the record, I would like the spellings of the names you used.

MR. BARSKE: Of the names?

COURT REPORTER: Of the people involved.

MR. BARSKE: Tom Rochovanski, R-O-C-H-O-V-A-N-S-K-I. Dr. William Neering.

Now, those were medically treated, and we never found out what they were, and never found out what the bit of tissue that they excised from my arm. They did both bacteria and chemical on it, but it did sear into the skin, and made a definite pit, and I had something that had to be removed.

Now, as I say, I am concerned with the whole river system in that area.

Thank you.

MS. LESKEN: Thank you.

MR. HOAGLAND: Thank you.

MS. LESKEN: Is there anyone else that wanted to make a comment?

(Pause.)

MS. LESKEN: Don't be shy. This is your opportunity.

(Pause.)

FROM THE FLOOR: Can I ask another question?

MS. LESKEN: Sure.

FROM THE FLOOR: The gentleman said that there was no more -- no more dumping at the contaminated area.

Is there any attempt to go after whoever dumped? I mean, what does it take to -- to go back and get compensation for that?

MS. LESKEN: Okay. This is -- this part of the meeting is for formal comment. So we can either enter that into the record, or we can end this, and then we can help you.

FROM THE FLOOR: Okay. Let me rephrase it. Why doesn't the proposal include going after the dumpers?

MS. LESKEN: Okay. This proposed plan is a proposed plan for the remedial action, the technical action at the site.

There is a whole other component of our -- our work, which is enforcement, which entails those types of things. If you want to just wait until this part is over, we can go over that.

This plan that you have is technical in nature, in terms of that.

Are there any other people that would like to make a comment into the record?

(Pause.)

MS. LESKEN: Okay. So we'll go back to--

MR. WOLFE: Val Wolfe.

MS. LESKEN: --Val Wolfe.

MR. WOLFE: I'm not a chemist, but I have three items that I question on the list that lists the contaminants.

One, is we received a letter in the fall of 1980 from our First Water District Department, signed by Mr. Kelly, the previous supervisor.

They indicated that there was 1 to 4 dioxin, in -- in the tests that they had made. There was also ethylene glycol, and I can't pronounce this other one. Perhaps you can?

MR. HOAGLAND: Menthyletheyketone?

MR. WOLFE: That's right. I don't see them listed on this listing of contaminants, and I wondered why they are not listed there.

Thank you.

MS. LESKEN: Thank you.

(Pause.)

MS. LESKEN: Is there anyone else that would like to make a comment?

(Pause.)

MS. LESKEN: If not, we'll close this part of the meeting, and just so you know, all the comments that were received tonight, as well as any written comments that are received in our office before August 25th -- and the address as to where to send them is in the proposed plan -- will be responded to in a formal nature, in a document called a Responsiveness Summary, when we actually do our Record of Decision, which is a decision document for the remediation at the Kellogg-Deering site.

For anyone that is interested, all of the information and the reports are downstairs in the Library here, as well as in our office in Boston, if you want to look at further information.

We are talking comments tonight and in writing, on both the preferred Alternative and any of the other alternatives that are described in the feasibility study which is the large document downstairs. So if anyone wanted to look at it, they are more than welcome to look at that at anytime, too.

(Pause.)

MS. LESKEN: I don't hear any other -- is there anyone else with a formal comment? We will close this part of the meeting.

(Pause.)

MS. LESKEN: We will be off the record.

(Whereupon, on August 14th, 1989, at 8:00 pm, the public hearing was closed.)

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings before: ENVIRONMENTAL PROTECTION AGENCY

in the Matter of:
PROPOSED CLEANUP PLAN FOR
THE KELLOGG-DEERING SUPERFUND SITE

Place:Norwalk, Connecticut

Date: August 14, 1989

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken of the above entitled proceeding.

J. Luff
Reporter

8/14/89
Date

D. Brideau
Transcriber

8/21/89
Date

Not included.

19

Kellogg-Deering Well Field

NPL Site Administrative Record

Index

Compiled: October 31, 1988
Updated: July 26, 1989
ROD Signed: September 29, 1989

Prepared for

Region I
Waste Management Division
U.S. Environmental Protection Agency

With Assistance from

AMERICAN MANAGEMENT SYSTEMS, INC.
One Kendall Square, Suite 2200 • Cambridge, Massachusetts 02139 • (617) 577-9915

2c

RECORD OF DECISION
KELLOGG-DEERING SITE - OPERABLE UNIT 2
SOURCE CONTROL

APPENDIX B

ADMINISTRATIVE RECORD INDEX

21

RECORD OF DECISION
KELLOGG-DEERING SITE - OPERABLE UNIT 2
SOURCE CONTROL

APPENDIX C

STATE CONCURRENCE LETTER

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

September 29, 1989

Paul Keough
Acting Regional Administrator
US EPA Region I
JFK Federal Building
Boston, MA 02203

Dear Mr. Keough;

The Connecticut Department of Environmental Protection (DEP) concurs with the remedy selected for the second operable unit of the Kellog-Deering Superfund Site. Our concurrence is provided with the understanding that the operable unit for which a remedy has been selected consists of the "source area" of the contamination affecting the Kellogg-Deering Well Field, as defined in the proposed plan, and that the downgradient area will be evaluated as a third operable unit for which a separate remedy and Record of Decision will be prepared. Furthermore, DEP's concurrence with the selected remedy for the second operable unit shall not be considered concurrence with a no action remedial alternative for the third operable unit. In providing this concurrence, the State finds that the selected remedy will satisfy all applicable or relevant and appropriate State laws and regulations.

Since it is inconsistent with Connecticut's Water Quality Standards, goals, and policies to endorse any significant delay in remediation of areas contributing contamination to the Kellogg-Deering Well Field, I am requesting that within 60 days of the signing of this Record of Decision, technical staff from EPA and DEP meet to discuss areas within the third operable unit where additional information is needed, and to possibly resolve technical areas of disagreement.

Sincerely,

Leslie A. Carothers
Commissioner

LAC:CA:am

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